ADDENDUM 3

Addendum #	3	**Date Issued**	Nov. 17th, 2026
Project Name | Job #	Bismarck Fire Station 6		20253510
Bid Date | Time	Dec. 3rd, 2026		3:00pm Local Time

THIS ADDENDUM AMENDS AND BECOMES PART OF THE CONTRACT DOCUMENTS FOR EAPC PROJECT 20253510 DATED October 29th, 2026, RESPECTIVELY. EACH BIDDER SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY MARKING THE ADDENDUM NUMBER AND DATE ON THE BID FORM.

****BID DATE CHANGE: Dec 3rd, 2026****

*****Please Note Allowance Spec Section – Affects GC, MC, EC *****

PRE-BID MEETING - NONE

PLAN HOLDERS LIST

The current Plan Holders List is attached.

SPECIFICATIONS

00 2000	**ADD** Soils Report – see attached
00 3000.1	**REVISE** Bid Form – see attached bid form with new Bid Date
01 4000	**DELETE** 1.10 A & D – (clarify - Testing by contractor)
07 2100	**ADD** paragraph 1.1.D as follows: Batt insulation in interior wall constructions.
	ADD paragraph 2.1.F as follows: Insulation Underside of Floor Slab: Extruded Polystyrene (XPS) board.
	ADD paragraph 2.1.G as follows: Insulation Inside Exterior Insulation Finish System as outlined within section 07 2400.

	ADD paragraph 2.2.A.8 Board Compression: 1000 psi within Apparatus Bay floor and snow melting pipe locations. 400 psi at all other areas of below slab insulation.
07 2119	**ADD** the full specification section 07 211 – Foamed-In-Place Insulation, with attached.
07 2400	**CLARIFICATION** paragraph 1.1.B to read as follows: Drainage and water-resistive barriers over full shell of buildings; behind all insulation board for EIFS and Brick finishes.
09 2116	**CLARIFICATION** paragraph 2.1.D. Cementous Backing board to be installed within Wet Areas and behind all areas to receive ceramic tile.
12 3661.19	**DELETE** 'Carrara Cordena' reference within paragraph 2.1.A.1.a.
23 3100	**Remove** 2.2B Metal duct coating.
23 3500	Vehicle Exhaust specification bid to be carried by the mechanical contractors through the listed approved vendor.

DRAWINGS

A021	**ADDED** J wall type.
A201	**REVISED** Keynote AE02 detail reference.
	DELETE M4 wall in Room 130 – Hose Drying.
	ADDED J wall type callout in Fitness Room.
	REVISED Keynote AE02 detail reference.
A401	**ADDED** Keynote for patio screen. AE 57: INSTALL A 6' VINYL FENCE SCREEN AS DEPICTED ON PLAN. BOTTOM RAIL OF FENCE SHALL BE A MAX OF 1" FROM CONCRETE. POST FOOTINGS SHALL BE 4' DEEP, 12" DIAMETER. FENCING SHALL BE A 6' PVC CHESTERFIELD WITH CERTAGRAIN TEXTURE AS MANUFACTURED BY CERTAINTEED CORPORATION, OR APPROVED EQUAL. COLOR: NATURAL CLAY.

A521	**CLARIFICATION** detail 1/A521, ‘STEEL PLATE STRINGER’ to be revised to ‘STEEL CHANNEL STRINGER’.
A703	**DELETE** M4 wall from 9/A703
	ADDED Keynotes AE 52 and AE 58 to 6/A703
	ADDED Keynotes AE 58 to 16/A703
A801	**DELETE** Door Schedule Note #4 from the following doors: 101, 108, 128C, 128G, 128H, 128L.
	ADD Door Schedule Note #4 to the following doors: 128D, 128E, 128F, 128I, 128J, and 128K.
M201	All mechanical housekeeping pads by MC.
M202	All mechanical housekeeping pads by MC.
M301	All mechanical housekeeping pads by MC.
M302	All mechanical housekeeping pads by MC.
M801	Air Handling Unit Schedule note 5 shall read. Dual Direct drive fans with VFDs, VFDs by ATC.
P801	Revised SH-2 remarks on plumbing fixture schedule, fully equipped with seat-ADA
E301	Revised fixture zoning.
	Revised lighting controls from analog to digital.
E302	Revised fixtures to include night light types.
	Added light switch to Training/Storage room 201.
E803	Revised fixtures BB and DD descriptions to include steel pole.
E902	Revised panel LLS schedule to include surge protection device.

PRIOR APPROVALS

06 4100	Casework	Bismarck Kitchens

23 7433	Make Up Air Units	Daikin
	Contractor to verify units fit with in mechanical room space	
23 7313	Air Handling Units	VTS
	Contractor to verify units fit with in mechanical room space	

ATTACHMENTS

Updated Plan Holders List

See attached

Specifications:

00 2000 Information available to Bidders – SOILS REPORT
00 3000.1 BID FORM
01 1000 Summary

Drawings:

A021	**A703**	**E803**
A201	**E301**	**E902**
A401	**E302**	
A801		

END ADDENDUM 3

EAPC

PLAN HOLDERS LIST
Fire Station #6
Bismarck, ND 58503
EAPC Project: # 20253510

BID DATE: Thursday, **December 3**, 2026
BID TIME: 3:00 PM CST

PLAN HOLDER	CONTACT PERSON	ADDRESS	CITY	STATE	ZIP	PHONE	FAX	EMAIL
EAPC	Brett Donat	116 West Main Ave	Bismarck	ND	58501	701-224-7306		brett.donat@eapc.net
BUILDERS EXCHANGES								
Aberdeen Builders Exchange		302 N. Jackson Street	Aberdeen	SD	57401	605-290-4210		dakotabuild@midconetwork.com
Billings Builders Exchange		2050 Broadwater Avenue	Billings	MT	59102	406-652-1311	406-652-1391	bbx@billingsplanroom.com
Bismarck Builders Exchange		215 Airport Road	Bismarck	ND	58504	701-258-4215	701-258-1391	info@bbxnd.com
Bismarck-Mandan Builders Exchange		P. O. Box 550	Mandan	ND	58554	701-667-4322	701-667-5217	bismanblderex@gmail.com
CMD (Construction Market Data)		Suite 500	Norcross	GA	30092	770-417-4000	800-508-5370	content@constructconnect.com
Construction Industry Center		Box 1227	Rapid City	SD	57709	605-343-5252	605-343-4591	cic@constructionindustrycenter.com or chrissy@constructionindustrycenter.com
Fargo-Moorhead Bldrs. Exchange		P. O. Box 10076	Fargo	ND	58106	701-237-6772	701-232-1653	upload
Grand Forks Builders Exchange		2211 S. Washington St. Ste D	Grand Forks	ND	58201	701-772-7798	701-772-0387	planroom@bntgf.com
McGraw Hill Const./Dodge Plan Rm.		1401 Glenwood Avenue No.	Minneapolis	MN	55405	612-381-2290	612-381-2295	dodge.docs@construction.com
Minnesota Builders Exchange		1123 Glenwood Avenue	Minneapolis	MN	55405	612-381-2620	612-381-2621	new project: jb@mbex.org addendums: addenda@mbex.org
Minot Builders Exchange		2424 Burdick Expy East	Minot	ND	58701	701-838-5353	701-839-0638	mbe1@srt.com
Plains Builders Exchange		220 N. Kiwanis Ave.	Sioux Falls	SD	57104-2530	605-334-8886	605-334-0112	info@plainsbuilders.com
QuestCDN.com								www.questcdn.com
Sioux Falls Builders Exchange		1418 "C" Avenue	Sioux Falls	SD	57104	605-357-8687	605-357-8655	info@sfbx.com
Williston Builders Exchange		2108 - 4th Ave. West	Williston	ND	58801-3423	701-572-9460	701-572-2511	willistonbuildersexchange@gmail.com
CONTRACTOR								
Roers	Matt Thomas					701-495.1416		mthomas@roers.com
Capitol City Construction	Erik Bilstad					701.570.1817		erik@cccincnd.com
JN Contracting	Tyler Kellen					701.478.4567		estimating@jncbuilds.com
JE Dunn	Katie Weeks					612.358.3987		katie.weeks@jedunn.com
First Dakota Enterprises	Kyle McKeever					605.223.9600		kyle.mckeever@firstdakotaenterprises.com
Oztech Electric						701.390.6886		office@oztechelectric.com
Northwest Contracting	Jennifer					701.255.7727		Jennifer@northwestcontracting.com
Paramount Builders	Eric					701.258.0088		estimating@buildparamount.com
Missouri River Contracting	Donnie					701.258.9140		donnie@missouririvercontracting.com
Comstock Construction, Inc of Minnesc	Brady Pederson					218.332.7363		bpederson@comstockconst.com
SUPPLIER OR SUBCONTRACTOR								
Core and Main LP	Heather Schumacher					314.432.4700		heather.schumacher@coreandmain.com
SiteWorx Excavation	Cayne Cymbaluk					701.425.1874		caynec@site-worx.net
Phaze Concrete Inc	Lyle Jeffs					435.703.8122		lylej@phazeconcrete.com
Dakota Supply Group - Waterworks	Mitchell Spotts					612.236.9355		mitchell.spotts@dsqsupply.com
Oldcastle Infrastructure	Derek Strei					320.424.1638		derek.strei@oldcastle.com
Sentry	Brady Burghardt					605.753.0880		estimating@sentryusa.com
Northern Valley Electrical Service	Danny Lamberson					701.757.3865		dlamberson@nvesi.com
Ferguson Waterworks- Fargo	Shawn Schmidt					701.293.5511		shawn.schmidt@ferguson.com
North Star Ready Mix	Kevin Werre					701.202.8048		kevin.werre@northstarreadymix.com
YSTAAS ELECTRICAL SERVICES	Rohnnie Nacota					701.483.8330		rohnnie.nacota@cjyes.com

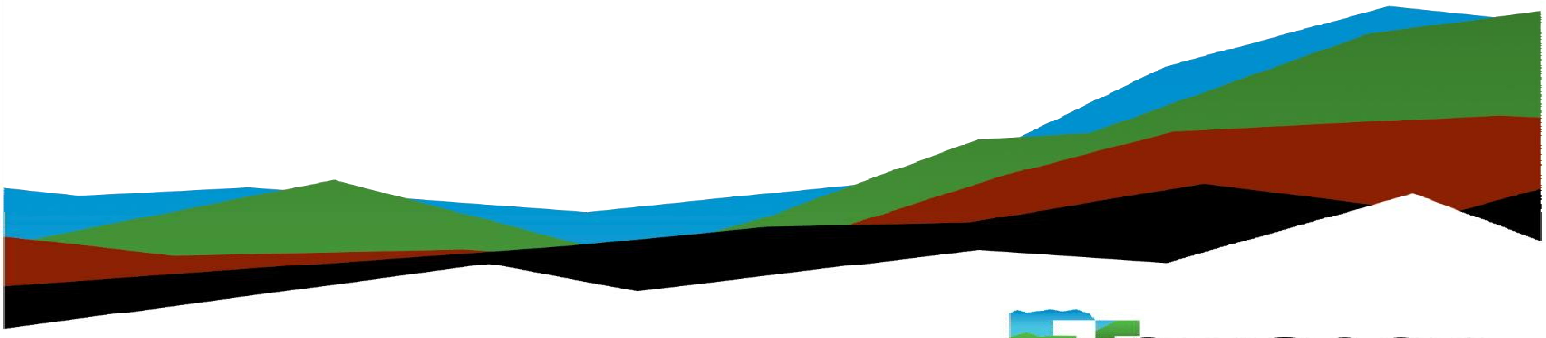
Bismarck Fire Station 6

Geotechnical Engineering Report

November 17, 2026 | Terracon Project No. 1000071643

Prepared for:

EAPC Architects Engineers
116 West Main Ave
Bismarck, ND, 58501



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November 17, 2026

EAPC Architects Engineers
116 West Main Ave
Bismarck, ND, 58501

Attn: Brett Donat, AIA
P: (701) 220-2646
E: brett.donat@eapc.net

Re: Geotechnical Engineering Report
Bismarck Fire Station 6
North side of the intersection of Burleigh Ave and Calypso Dr
Bismack, ND
Terracon Project No. 1000071643

Dear Mr. Donat:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. 1000063724 dated September 29, 2026. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Josh A. Brilz
Assistant Project Manager

REGISTERED PROFESSIONAL ENGINEER
CHAD A COWLEY
PE-7111
DATE 11/17/2026
NORTH DAKOTA

Chad A. Cowley, P.E.
Department Manager

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Exploration and Testing Procedures
Site Location and Exploration Plans
Exploration and Laboratory Results
Supporting Information

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed fire station to be located at the North side of the intersection of Burleigh Ave and Calypso Dr in Bismack, ND. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Dewatering considerations
- Foundation design and construction
- Floor slab design and construction
- Pavement earthwork and preparation
- Frost considerations

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs or as separate graphs in the **Exploration Results** section.

Project Description

Our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for proposal was provided by EAPC on September 17, 2026. The request included a conceptual plan drawing of the planned development along with anticipated boring locations.

Item	Description
Proposed Structure	The proposed structure is a single story, approximately 11,543 sq. ft fire station that will consist of CMU bearing walls in the apparatus bay and wood framing in the living quarters section of the station. The building is anticipated to be slab-on-grade with associated parking and drive areas.
Building Construction	CMU bearing walls (Apparatus bay) Wood frame (Living Quarters) Slab-on-grade
Finished Floor Elevation	A finished floor elevation (FFE) was not provided, however, EAPC has assumed that finished floor is not more than 1-2 feet within existing grades.
Maximum Loads	Anticipated structural loads were provided by EAPC: ▪ Columns: 70 kips ▪ Walls: 4 kips per linear foot (klf) ▪ Slabs: 250 pounds per square foot (psf)
Grading/Slopes	Final slopes are anticipated to be minimal and only to achieve positive drainage from the building. Cuts and fills are not expected to exceed 2 feet to develop final grade.
Below-Grade Structures	None.
Free-Standing Retaining Walls	None.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits and maximum anticipated loads, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located along the North side of the intersection of Burleigh Ave and Calypso Dr in Bismack, ND. Latitude: 46.7661° N, Longitude: 100.8051° W See **Site Location**

Item	Description
Existing Improvements	Burleigh Ave to the south of the site with a walking trail parallel to Burleigh Ave.
Current Ground Cover	Lightly to heavily vegetated. Mature trees are located on the site. Asphalt-paved walking trail.
Existing Topography	The site is relatively level. Total change in elevation across the site as measured across our boring locations is on the order of 1 foot.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Surface**	Topsoil and rootzone – dark brown
2	**Clay 1**	Lean Clay – varying amounts of sand, gray to brown, very soft to very stiff
3	**Silt**	Silt – varying amounts of sand, brown to brownish gray, very soft to soft
4	**Clay 2**	Fat Clay – brown, medium stiff to very stiff
5	**Sand**	Silty Sand – fine to coarse grained, brownish gray, very loose to dense

The boreholes were observed while drilling and after completion for the presence and level of groundwater. The water levels observed in the boreholes can be found on the boring logs in the **Exploration Results**, and are summarized below.

Boring Number	Approximate Elevation of Groundwater while Drilling (feet)[1]	Approximate Elevation of Groundwater from Laboratory Observations (feet)[2]
B-01	Not observed while drilling	86.5
B-02	73.0	82.5
B-03	82.5	--
B-04	77.5	--
B-05	78.0	--
B-06	72.5	90.5
B-07	Not observed while drilling	88.0
B-08	Not observed while drilling	85.5

1. When referenced to the benchmark as shown in the **Exploration Plan**.
2. Based on visual observations from collected samples in our laboratory.

The water levels summarized above may not be stable groundwater levels. A relatively long period may be necessary for a groundwater level to develop and stabilize in a borehole. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels.

Groundwater conditions may be different at the time of construction. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

For design purposes of deep foundation systems, we estimate the groundwater level to be as high as elevation 90.5 feet at the time of our field investigation.

Seismic Site Class

Site Class

Seismic design requirements for structures are based on Seismic Design Category. Site Class is required to determine the Seismic Design Category for a structure. The 2024 IBC references ASCE 7-22 for determination of Site Class and seismic design parameters. ASCE 7-22 Site Classes are based on shear wave velocities within the upper 100 feet of the subsurface materials at the site.

Borings were advanced as part of our field exploration and SPT N-values (blow counts) were collected. For determination of the ASCE 7-22 Site Class, Terracon used published SPT/shear wave velocity correlations[1] to determine the average shear wave velocity. Based on the blow counts measured in the borings and the shear wave velocity correlations, we recommend consideration of a **Site Class E** be used for seismic design. This considers the 1.3 modification factor, as outlined in ASCE 7-22, and the critical value from each site class at each period should be considered. Geophysical testing may be performed to confirm the conditions below the current boring depth and aid in refining the seismic site class.

Geotechnical Overview

The proposed structures can be supported on a spread footing foundation system bearing on granular structural fill, provided the recommendations presented herein are implemented in design and construction phases. The **Shallow Foundations** section addresses support of the structures on granular structural fill. The **Floor Slabs** section addresses slab-on-grade support of the structure on granular structural fill. Additional site preparation recommendations including subgrade improvement and fill placement are provided in the **Earthwork** section.

The native soils encountered at the site are susceptible to frost heaving and ice lens formation. The soils will experience heaving during the winter months and a subsequent loss of strength and settlement during spring thaw. Therefore, seasonal movement of exterior pavements and sidewalks should be expected due to the extreme temperature changes which will occur. The **Frost Considerations** section provides recommendations to reduce the potential for frost heaving.

As an alternative to over-excavating the soft soils to increase the available bearing capacity and/or decreasing the anticipated settlement, a ground improvement system such as rammed aggregate piers or vibratory stone columns can be installed, as discussed in the **Ground Improvement** section. Structures may also obtain support on drilled shafts. A full-depth temporary steel casing may be required to stabilize the sides of the shaft excavations in the overburden. The **Deep Foundations** section addresses design recommendations and construction considerations for drilled shafts.

---

1. Wair, B.R., and Dejong, J.T., 2012, Guidelines for Estimation of Shear Wave Velocity Profiles, Pacific Earthquake Engineering Research Center, PEER Report 2012/08

Based on our field measurements and laboratory observations, the ground water level is on the order of 7 to 10 feet below existing grades. Water-bearing silts were encountered near these depths. Construction difficulties would be expected in open excavations which extend below the groundwater table. In clayey soils, the groundwater seepage in open excavations should be controllable with sump pumping. However, in the water-bearing silts, the groundwater table would need to be lowered below the bottom of the excavation prior to the placement of structural fill or concrete. A dewatering system may need to be designed by a specialty contractor.

The near surface clays could become unstable with typical earthwork and construction traffic, especially after precipitation events. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the **Earthwork** section.

Expansive soils are present on this site. This report provides recommendations to help mitigate the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and (at least minor) cracking in the structure should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if modification of the site results in excessive wetting or drying of the expansive soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. Some of these options are discussed in this report such as complete replacement of expansive soils or a structural slab.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include clearing and grubbing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Prior to placing fill, existing vegetation, topsoil, and root mats should be removed. Complete stripping of the topsoil should be performed in the proposed building and parking/driveway areas. Based on the soil conditions encountered in our borings, up to 1 foot is expected to be adequate in most areas to remove vegetation and root mat. However, isolated areas of both deeper and shallower stripping are expected. We recommend site stripping, subgrade preparation, and compaction procedures extend at least 5 feet beyond the perimeter of the structures and at least 2 feet beyond the pavement edges, where feasible.

As previously discussed, the groundwater table is estimated at an elevation of 90.5 feet. Due to the shallow ground water in relation to anticipated excavation depths as well as soft soil conditions encountered at anticipated structure depths, we recommend constructing an initial rock layer with a thickness of approximately 12 to 24 inches in order to obtain conditions on which structural fill or concrete can be placed. The rock should be angular and should not exceed three inches in any dimension. We further recommend placing a geotextile separation fabric in the bottom of the excavation which should extend up each side of the excavation a sufficient distance to wrap around the top of the rock. The rock should be surface compacted prior to wrapping the top and placement of structural fill. Consideration should be given to dewatering the site to facilitate the over-excavation and refill operation.

Mature trees are located within or near the footprint of some of the proposed buildings, which will require removal at the onset of construction. Tree root systems can remove substantial moisture from surrounding soils. Where trees are removed, the full root ball and all associated dry and desiccated soils should be removed. The soil materials which contain less than 5 percent organics can be evaluated for reuse as structural fill, provided the material is moisture conditioned and properly compacted.

Although no evidence of fill or underground facilities (such as septic tanks, cesspools, basements, and utilities) was observed during the exploration and site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

We recommend that the soils within the footprint of the proposed structure be removed to a minimum depth of 4 feet below floor slabs and 5 feet below the bottom of footings and replaced with a granular structural fill. Structural fill placed beneath the entire footprint of the foundations should extend horizontally a minimum distance of 16 inches or 2/3 times the thickness of fill beyond the outside edge of footings. On-site soils free of organics may be suitable to be used as structural fill materials for exterior site

grading and below pavements, but should be tested to ensure they meet the outlined requirements prior to use as structural fill. On-site fat clay materials anticipated to be developed as excavation spoils are not considered suitable for use as structural fill below the building but may be used as exterior backfill in landscape areas and under pavements or as general fill.

The pavement subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified by stabilizing with a geogrid product. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively workable; however, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and moisture conditioning.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas.

Reuse of On-Site Soil: Excavated on-site soil may be selectively reused as structural fill. Portions of the on-site soil have an elevated fines content and will be sensitive to moisture conditions (particularly during seasonally wet periods) and may not be suitable for reuse when above optimum moisture content. It is common practice in the Bismarck area to reuse the fat clays as structural fill below pavements as a cost savings measure. With this, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

Material property requirements for on-site soil for use as general fill and structural fill are noted in the table below:

Property	General Fill	Structural Fill
Composition	Free of deleterious material	Free of deleterious material
Maximum particle size	6 inches (or 2/3 of the lift thickness)	2 inches

Property	General Fill	Structural Fill
Fines content	Not limited	Less than 20% Passing No. 200 sieve (SM only)
Plasticity	Not limited	Liquid Limit of less than 40
GeoModel Layer Expected to be Suitable[1]	2, 3, 4, 5	2, 5

1. Based on subsurface exploration. Actual material suitability should be determined in the field at time of construction.

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Low Plasticity Cohesive	CL	Liquid Limit less than 40
Granular	GW, GP, GM, GC, SW, SP, SM, SC	Less than 20% passing No. 200 sieve (SM only)

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. Additional geotechnical consultation should be provided prior to use of uniformly graded gravel on the site.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as structural fill

Item	Structural Fill	General Fill
Minimum Compaction Requirements [1,2,3]	98% of max. below foundations and within 2 feet of floor slabs 95% of max. above foundations and more than 2 feet below floor slabs	90% of max.
Water Content Range [1]	Granular: as required to achieve min. compaction requirements Low plasticity cohesive: -3% to +3% of optimum High plasticity cohesive below pavements and exterior backfill: -1% to +3%	Same as structural fill Same as structural fill High plasticity cohesive: -3% to +3% of optimum

1. Maximum density and optimum water content as determined by the Standard Proctor test (ASTM D 698).
2. High plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.
3. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254). Materials not amenable to density testing should be placed and compacted to a stable condition observed by the Geotechnical Engineer or representative.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility to be supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of structural fill

discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the

materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

The groundwater table could affect overexcavation efforts, especially for overexcavation and replacement of lower strength soils. A temporary dewatering system consisting of sumps with pumps may be necessary to achieve the recommended depth of overexcavation depending on groundwater conditions at the time of construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include review of available final grading information or consider potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 100 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	2,000 psf - foundation bearing upon granular structural fill
Required Bearing Stratum [3]	Granular structural fill
Minimum Foundation Dimensions	Per IBC
Ultimate Passive Resistance [4] **(equivalent fluid pressures)**	265 pcf (cohesive backfill) 390 pcf (granular backfill)
Sliding Resistance [5]	300 psf allowable cohesion (native/structural fill clay) 0.45 allowable coefficient of friction - granular material
Minimum Embedment below Finished Grade [6]	Exterior footings in unheated areas: 72 inches Exterior footings in heated areas: 60 inches Interior footings in heated areas: 12 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement [2, 7]	About ½ of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads.

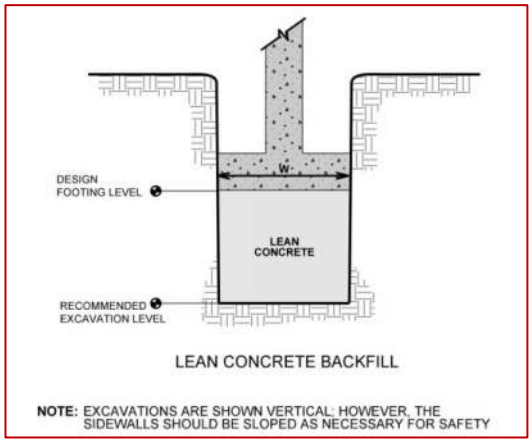
Item	Description

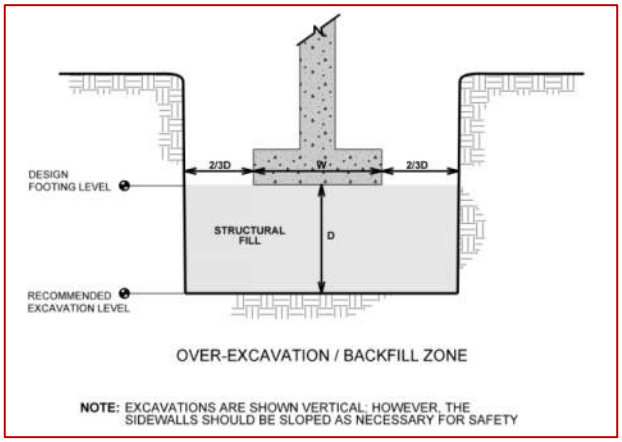
2. Values provided are for maximum loads noted in **Project Description**. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in **Earthwork**.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Assumes no hydrostatic pressure.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations. For fine-grained materials, lateral resistance using cohesion should not exceed ½ the dead load.
6. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
7. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Overexcavation for granular structural fill placement below footings should be conducted as shown below. The overexcavation should be backfilled up to the footing base elevation, with granular structural fill placed, as recommended in the **Earthwork** section.





Ground Improvement

As an alternative to over-excavating soft/unsuitable soils, the structure and potentially floor slabs could be supported on lower strength/lower density native soils if ground improvement methods are utilized. Ground improvement methods are proprietary systems designed by licensed contractors who could provide further information regarding support options.

A possible ground improvement alternative that may allow more efficient shallow foundation support (i.e. higher allowable bearing pressures and/or lower estimated settlement) includes the installation of aggregate piers. An aggregate pier consists of a stone-filled column constructed by excavating a cylindrical hole and backfilling it with crushed stone placed in lifts and applying a high degree of compactive effort resulting in stone filled piers. The aggregate pier construction process not only results in a rigid stone-filled column that lends support to structures, it also helps to densify the soils surrounding the pier. Aggregate pier foundations are a proprietary product and, if considered, should be designed and installed by a specialty contractor. Due to the specialty of this soil improvement procedure, we recommend that a performance specification be used for this system.

If aggregate piers are considered, the expansive fat clays should still be removed below the floor slab area as detailed in the **floor slabs** section below.

We understand if aggregate pier foundations are utilized, the aggregate pier design firm will be the geotechnical engineer of record for these foundations. As such, the design firm would provide the necessary design parameters for the planned foundation system including, but not limited to, allowable bearing capacity, settlement estimates and foundation-specific earthwork recommendations.

Deep Foundations

Drilled Shaft Design Parameters

Soil design parameters are provided below in the **Drilled Shaft Design Summary** table for the design of drilled shaft foundations. The values presented for allowable side friction and end bearing include a factor of safety.

Drilled Shaft Design Summary [1]

Elevation (feet)	Stratigraphy [2]		Allowable Skin Friction (psf) [3]	Allowable End Bearing Pressure (psf) [4]
	No.	Material		
97 – 93	2	Clay	10	--
93 – 88	2	Clay	75	--
88 - 75	2	Clay	50	1,750
75 – 56	5	Sand	1,000	2,500

1. Design capacities are dependent upon the method of installation and quality control parameters. The values provided are estimates and should be verified when installation protocol have been finalized.
2. See Subsurface Profile in **Geotechnical Characterization** for more details on stratigraphy.
3. Applicable for compressive loading only. Reduce to 2/3 of values shown for uplift loading. The effective weight of the shaft can be added to uplift load resistance to the extent permitted by IBC.
4. Shafts should extend at least one diameter into the bearing stratum (or to a depth equal to the bell diameter for belled shafts) for end bearing to be considered.

Shafts should be adequately reinforced as designed by the Structural Engineer for both tension and shear to sufficient depths. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Drilled shaft should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piles in a group versus the capacity calculated using the perimeter and base of the pile group acting as a unit. The lesser of the two capacities should be used in design.

A shaft diameter in the range of 24 to 48 inches should be used. Drilled shafts should have a minimum length of 10 feet and should extend into the bearing strata at least one shaft/pile/bell diameter for the allowable end-bearing pressures listed in the above table.

Post-construction settlements of drilled shafts designed and constructed as described in this report are estimated to range from about ½ to 1¼ inch. Differential settlement between individual shafts is expected to be ½ to ⅔ of the total settlement.

Drilled Shaft Lateral Loading

The following table lists input values for use in LPILE analyses. Such analysis should be considered if lateral loads exceeds 10 kips. Modern versions of LPILE provide estimated default values of k_h and E_{50} based on strength and are recommended for the project. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

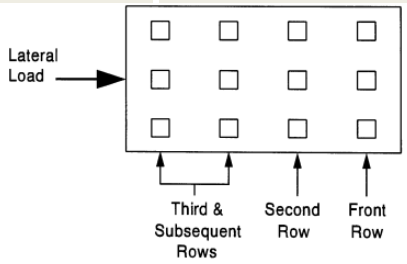
Stratigraphy[1]		L-Pile Soil Model	S_u (psf)[2]	ϕ[2]	γ' (pcf)[2]	ε_{50}	K (pci)	
Elevation	Material						Static	Cyclic
97 – 93	Residual clay	Stiff Clay w/o Free Water	1,000	--	80	Use Default Value		
93 – 88	Residual clay	Soft Clay w/o Free Water	375	--	130	Use Default Value		
88 - 75	Residual clay	Soft Clay w/o Free Water	250	--	62	Use Default Value		
75 – 56	Residual silty sand	Sand (Reese)	--	28°	52	Use Default Value		

1. See Subsurface Profile in **Geotechnical Characterization** for more details on Stratigraphy.
2. Definition of Terms:
   S_u: Undrained shear strength
   ϕ: Internal friction angle
   γ': Effective unit weight

When shafts are used in groups, the lateral capacities of the shafts in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent shaft. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:

Center to Center Pile Spacing [1,2]	P-Multiplier, P_m [3]		
	Front Row	Second Row	Third and Subsequent Rows
3B	0.8	0.4	0.3
4B	0.9	0.65	0.5
5B	1.0	0.85	0.7
6B	1.0	1.0	1.0

1. Spacing in the direction of loading. B = pile diameter
2. For the case of a single row of piles supporting a laterally loaded grade beam, group action for lateral resistance of piles would need be considered when spacing is less than three pile diameters (measured center-to-center).
3. See adjacent figure for definition of front, second and third rows.



Spacing closer than 3D (where D is the diameter of the shaft) is not recommended without additional geotechnical consultation due to potential for the installation of a new shaft disturbing an adjacent installed shaft likely resulting in axial capacity reduction.

Drilled Shaft Construction Considerations

The drilling contractor should be experienced in the subsurface conditions observed at the site, and the excavations should be performed with equipment capable of providing a clean bearing surface. The drilled straight-shaft foundation system should be installed in general accordance with the procedures presented in "Standard Specification for the Construction of Drilled Piers", ACI Publication No. 336.1-01.

The contractor is generally expected to use conventional “dry” techniques for installation of the drilled shaft. However, weak soils were observed in the borings. To prevent collapse of the sidewalls and/or to control groundwater seepage, the use of temporary steel casing and/or slurry drilling procedures may be required for construction of the drilled shaft foundations. Significant seepage could occur in case of excavations penetrating water-bearing sandy soil layers. Water or loose soil should be removed from the bottom of the drilled shafts prior to placement of the concrete. If casing is removed during concrete placement, care should be exercised to maintain concrete inside the casing at a sufficient level to resist earth and hydrostatic pressures present on a casing exterior. Concrete should be placed as soon as possible after the foundation excavation is completed, to reduce potential disturbance of the bearing surface. Arching of the concrete, loss of seal and other problems can occur during casing removal and result in

contamination of the drilled shaft. These conditions should be considered during the design and construction phases. Placement of loose soil backfill should not be permitted around the casing prior to removal. The drilled shaft contractor and foundation design engineer should be informed of these risks.

Use of a telescoping casing arrangement can be considered to avoid handling long casing lengths. The lower casing should be of sufficient length and stiffness and have an appropriate cutting edge to allow it to be firmly seated to seal out groundwater. If possible, excess water should be evacuated from the casing to place concrete in the "dry."

The drilling contractor should remove all soft and disturbed soils from the base of the drilled pier prior to placing concrete. The drilled shaft installation process should be performed under the observation of the Geotechnical Engineer. The Geotechnical Engineer should document the shaft installation process including soil and groundwater conditions observed, consistency with expected conditions, and details of the installed shaft.

Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

The subgrade soils are comprised of high plasticity clays exhibiting the potential to swell with increased water content. Construction of the floor slab, combined with the removal of trees, and revising site drainage creates the potential for gradual increased water contents within the clays. Increases in water content will cause the clays to swell and damage the floor slab. To reduce the swell potential, at least the upper 48 inches of subgrade soils below the floor slab should be an approved granular structural fill.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	Minimum 6 inches of free draining (less than 8% passing the No. 200 sieve) aggregate Subgrade compacted to recommendations in **Earthwork**
Estimated Modulus of Subgrade Reaction [2]	100 pounds per square inch per inch (psi/in) for point loads

Item	Description

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Frost Considerations

The soils on this site are frost susceptible, and small amounts of water can affect the performance of the slabs on-grade, sidewalks, and pavements. Exterior slabs should be anticipated to heave during winter months. If frost action needs to be eliminated in critical areas, we recommend the use of non-frost susceptible (NFS) fill or structural slabs (for instance, structural stoops in front of building doors). Placement of NFS material in large areas may not be feasible; however, the following recommendations are provided to help reduce potential frost heave:

- Provide surface drainage away from the building and slabs, and toward the site drainage system.
- Install drains around the perimeter of the building, stoops, below exterior slabs and pavements, and connect them to the site drainage system.
- Grade clayey subgrades so groundwater potentially perched in overlying fill or aggregate base, slope toward a site drainage system.
- Place NFS fill as backfill beneath slabs and pavements critical to the project.
- Place a 3 horizontal to 1 vertical (3H:1V) transition zone between NFS fill and other soils.
- Place NFS materials in critical sidewalk areas.

As an alternative to extending NFS fill to the full frost depth, consideration can be made to placing extruded polystyrene or cellular concrete under a buffer of at least 2 feet of NFS material.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner

is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Figures

Contents:

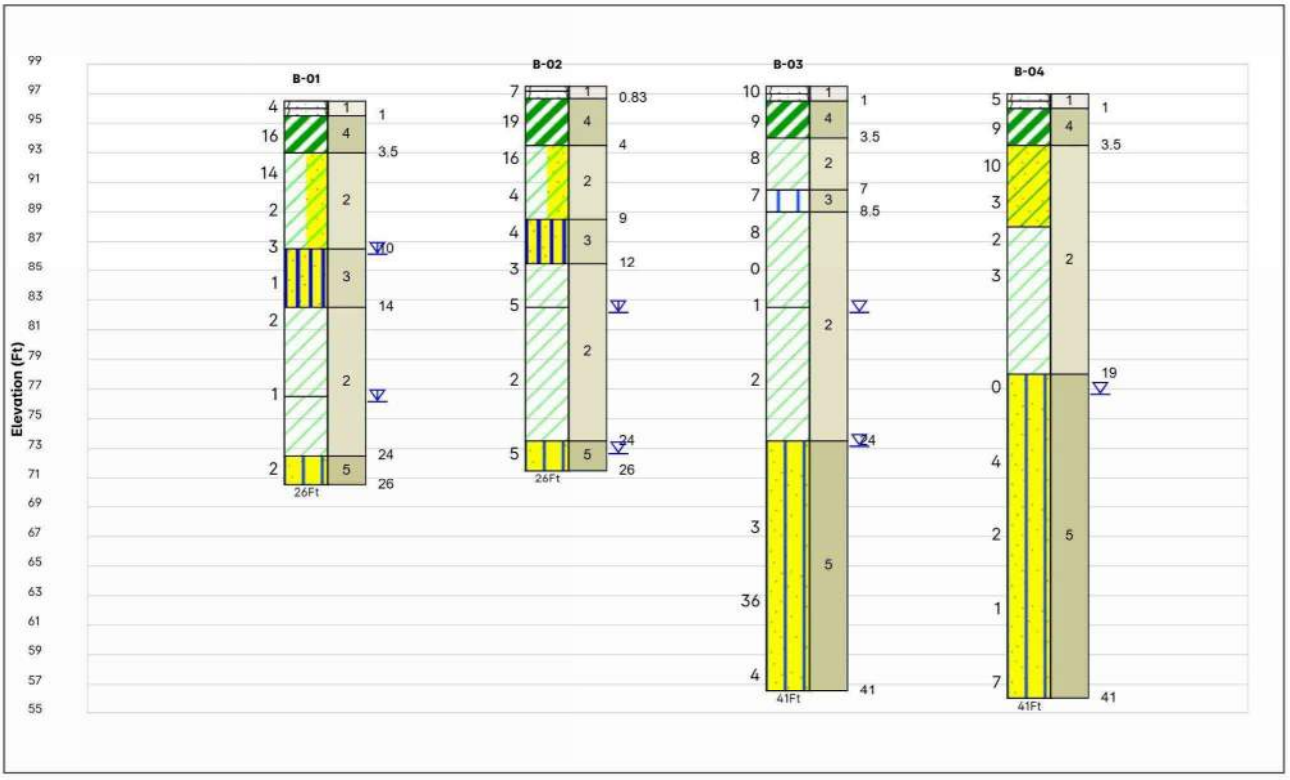
GeoModel (2 pages)

Note: All attachments are one page unless noted above.

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No: 1000071643

GeoModel

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
1	**Surface**	Topsoil and rootzone – dark brown
2	**Clay 1**	Lean Clay – varying amounts of sand, gray to brown, very soft to very stiff
3	**Silt**	Silt – varying amounts of sand, brown to brownish gray, very soft to soft
4	**Clay 2**	Fat Clay – brown, medium stiff to very stiff
5	**Sand**	Silty Sand – fine to coarse grained, brownish gray, very loose to dense

Legend

Topsoil | Root Zone | Fat Clay | Lean Clay | Sandy Silt
Silt | Silty Sand | Sandy Lean Clay | Lean Clay with Sand

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

Notes:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

First Water Observation
Second Water Observation
Third Water Observation

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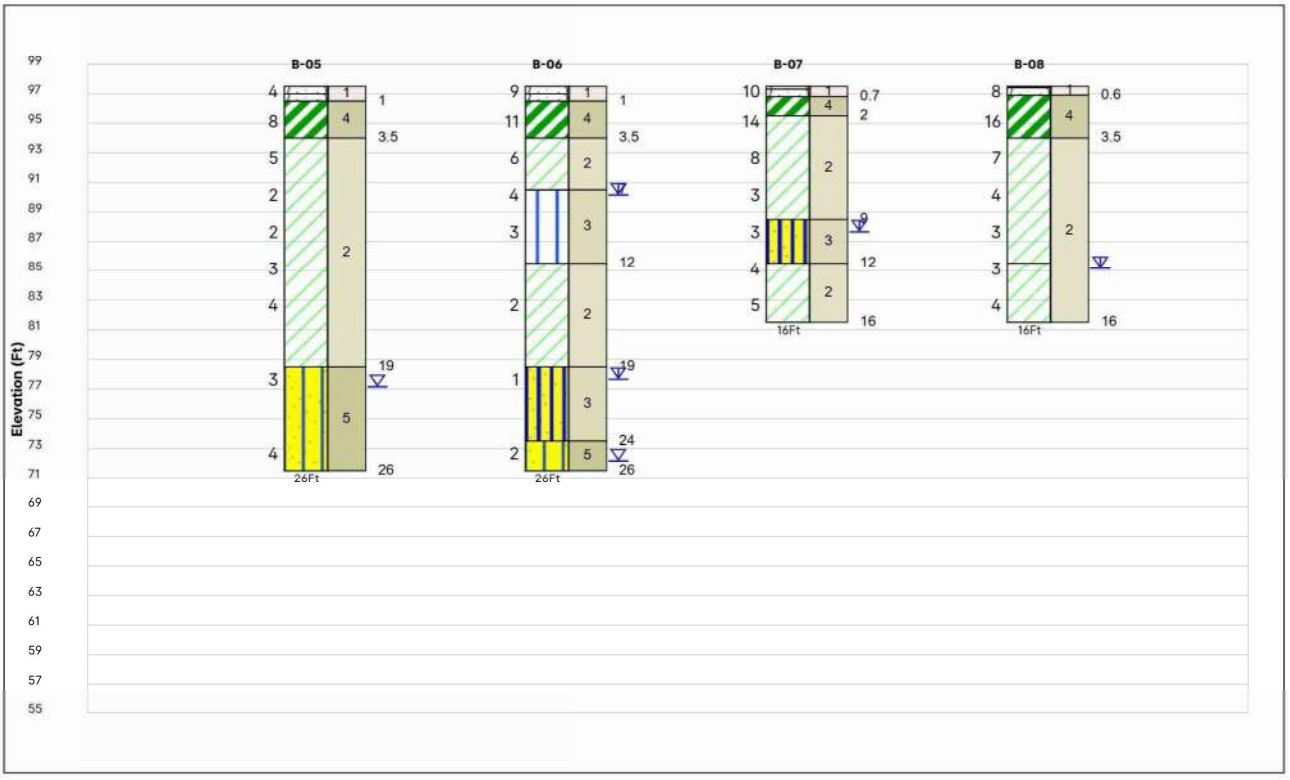

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First Water Observation
Second Water Observation
Third Water Observation

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
2	41	Building Area
4	26	Building Area
2	16	Parking/driveway area (B-7 and B-8)

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were obtained by the drill crew using a level and grade rod referenced to a temporary benchmark (see **Exploration Plan**). If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted rotary drill rig using continuous flight augers. Samples were obtained at 2½-foot intervals in the upper 15 feet of each boring and at intervals of 5 feet thereafter using thin-walled and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture content
- Dry unit weight
- Unconfined compression
- Atterberg limits
- Grain size analysis
- Moisture-density relationship
- California Bearing Ratio (CBR)

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

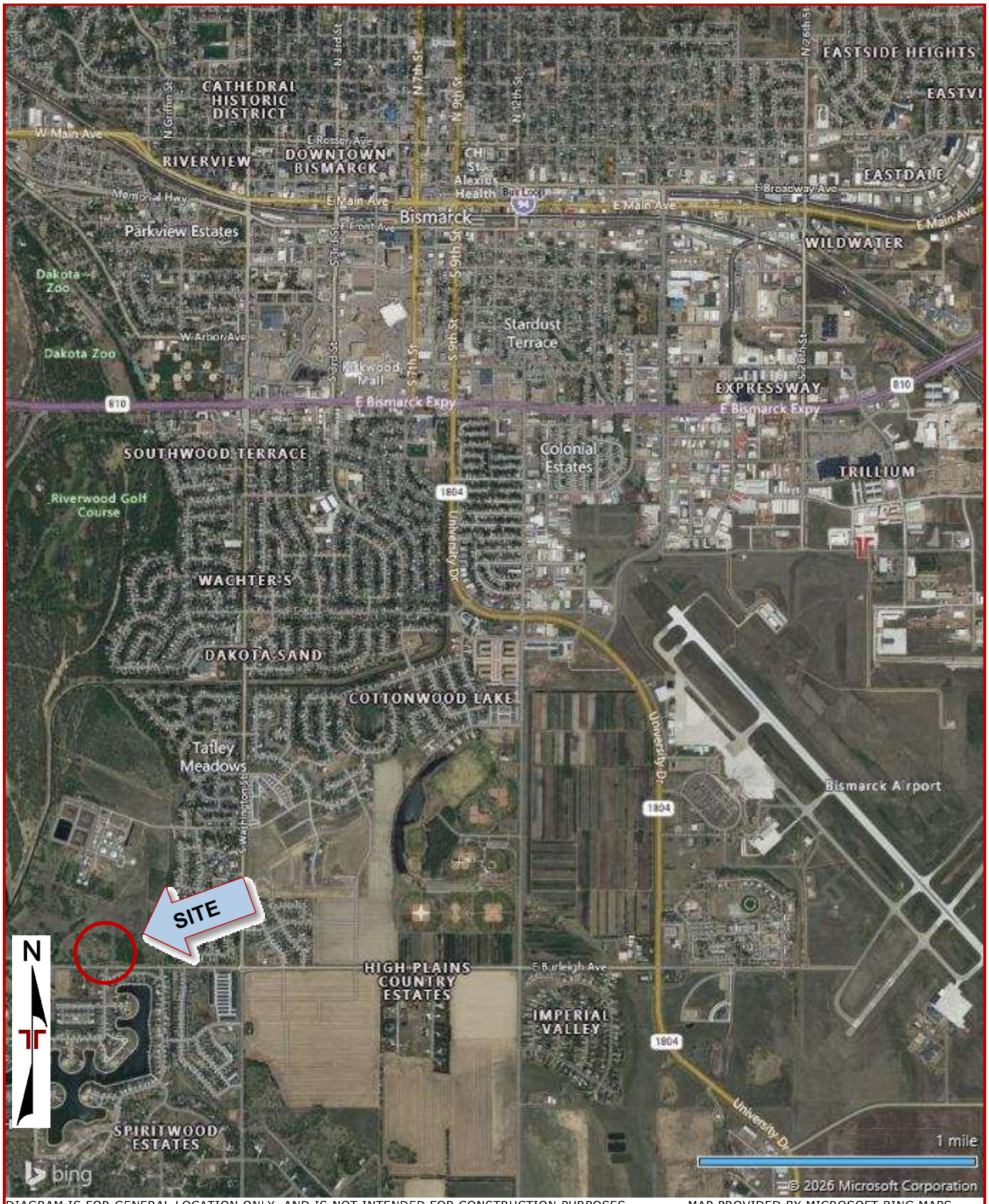


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-01 through B-08)
Unconfined Compressive Strength (2 pages)
Moisture Density Relationship
CBR

Note: All attachments are one page unless noted above.

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766280° Longitude: -100.805240°

BORING LOG NO. B-01

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
96.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Atterberg Limits LL	PL	PI
1		0.5	**TOPSOIL**, dark brown		96.5								
		1.0	**ROOT ZONE**, dark brown		96.0		5		1-2-2 N = 4	14.0			
4			**FAT CLAY (CH)**, brown, very stiff, organics from roots to approximately 3 ft		95.5								
							5		9-8-8 N = 16	14.0			
		3.5			93.0								
2			**LEAN CLAY WITH SAND (CL)**, brown, soft to stiff	5			5		5-6-8 N = 14	12.1	38	17	21
							4		2-1-1 N = 2	27.8			
		10.0		10	86.5		10	▽	WoH-1-2 N = 3	29.1			
3			**SANDY SILT (ML)**, brown, moist to wet, very soft to soft										
							10		WoH-WoH-1 N = 1	31.6			
		14.0			82.5								
2			**LEAN CLAY (CL)**, grayish brown, very soft to soft	15			16		WoH-1-1 N = 2	32.7			
		20.0		20	76.5		16	▽	WoH-1-WoH N = 1	32.1			
			waterbearing seams of silt at 20 ft										
		24.0			72.5								
5			**SILTY SAND (SM)**, fine to medium grained sand, brownish gray, very loose, waterbearing	25			16		WoH-1-1 N = 2	35.1			
			Boring Terminated at 26 ft.										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
Groundwater not encountered while drilling
▽ 10 Ft. 2026-11-03
▽ 20 Ft. 2026-11-03

Advancement Method
0-24.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57
Hammer Type
Automatic
Driller
JO
Energy Transfer Ratio (%)
84.10
Logged By
JH
Start Date
10/30/2026
Completion Date
10/30/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766290° Longitude: -100.804890°

BORING LOG NO. B-02

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Percent Fines
		0.3	**TOPSOIL**, dark brown		97.5							
		0.8	**ROOT ZONE**, dark brown		97.2							
4			**FAT CLAY (CH)**, brown, very stiff, organics to approximately 2 ft		96.7		8		1-3-4 N = 7	14.7		
							8		8-10-9 N = 19	17.9		99
		4.0			93.5							
2			**LEAN CLAY WITH SAND (CL)**, brown, soft to very stiff	5			3		6-7-9 N = 16	15.2		
							6		3-2-2 N = 4	20.1		
		9.0			88.5							
3			**SANDY SILT (ML)**, brown, moist to wet, soft	10			15		1-2-2 N = 4	33.9		
		12.0			85.5							
2			**LEAN CLAY (CL)**, brown to gray, soft to medium stiff				14		1-3-WoH N = 3	30.7	94	
		15.0		15	82.5		18	▽	WoH-2-3 N = 5	31.9		
			waterbearing seams of silt at 15 ft									
				20			18		WoH-WoH-2 N = 2	37.1		
		24.0			73.5							
5			**SILTY SAND (SM)**, fine to coarse grained sand, brownish gray, loose, waterbearing	25			12	▽	5-3-2 N = 5	33.9		
			Boring Terminated at 26 ft.									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
▽ 24.5 Ft. While drilling
▽ 15 Ft. 2026-11-03

Advancement Method
0-24.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57
Hammer Type
Automatic
Driller
JO
Energy Transfer Ratio (%)
84.10
Logged By
JH
Start Date
10/30/2026
Completion Date
10/30/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766360° Longitude: -100.804700°

BORING LOG NO. B-03

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	PL	PI
4		0.5 / 1.0	**TOPSOIL**, dark brown **ROOT ZONE**, dark brown		97.5 97.0		1		3-4-6 N = 10	15.3				
2		3.5	**FAT CLAY (CH)**, brown, stiff, organics to approximately 2 ft **LEAN CLAY (CL)**, grayish brown, medium stiff		96.5 94.0		2		9-6-3 N = 9	16.1				
				5			2		4-4-4 N = 8					
3		7.0 / 8.5	**SILT (ML)**, grayish brown, medium stiff		90.5 89.0		10		4-4-3 N = 7	31.0		33	27	6
2			**LEAN CLAY (CL)**, grayish brown to gray, very soft to medium stiff	10			10		4-4-4 N = 8	24.0				
							10		WoH-WoH-WoH N = 0	36.9				
		15.0	waterbearing seam of silt at 15 ft	15	82.5		10	▽	1-1-WoH N = 1	30.8				
				20			10		WoH-1-1 N = 2	31.7				
5		24.0	**SILTY SAND (SM)**, fine to coarse grained sand, brownish gray, very loose to dense, waterbearing	25	73.5			▽			23			
				30			10		WoH-1-2 N = 3	27.3				
				35			10		8-14-22 N = 36	21.0				
				40			10		WoH-2-2 N = 4	26.8				
			Boring Terminated at 41 ft.											

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
▽ 24 Ft. While drilling
▽ 15 Ft. While drilling

Advancement Method
0-39.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57

Hammer Type
Automatic

Driller
JO

Energy Transfer Ratio (%)
84.10

Logged By
JH

Start Date
10/23/2026

Completion Date
10/23/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766110° Longitude: -100.805240°

BORING LOG NO. B-04

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Fines	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
		0.5	**TOPSOIL**, dark brown		97.0											
		1.0	**ROOT ZONE**, dark brown		96.5											
4			**FAT CLAY (CH)**, brown, stiff, organics to approximately 2 ft		96.0		4		3-3-2 N = 5		21.7					
		3.5			93.5		6		5-5-4 N = 9		15.7					
2			**SANDY LEAN CLAY (CL)**, brown, soft to stiff, seams of sand	5			4		5-5-5 N = 10		15.9	108				
							4		1-2-1 N = 3		15.6					
		9.0			88.0											
			LEAN CLAY (CL), brown, soft to medium stiff, silty texture	10			10		7-1-1 N = 2		30.9					
							10		1-1-2 N = 3		31.2					
				15						1060	30.4	93	99	38	20	18
		19.0			78.0											
5			**SILTY SAND (SM)**, fine to coarse grained sand, grayish brown, very loose to loose, waterbearing	20			18	▽	1-WoH-WoH N = 0		37.9					
				25			18		2-2-2 N = 4		24.3					
				30			16		WoH-1-1 N = 2		23.3					
				35			12		1-WoH-1 N = 1		20.1					
				40			12		4-3-4 N = 7		28.5					
			Boring Terminated at 41 ft.													

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
▽ 20 Ft. While drilling

Advancement Method
0-39.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57

Hammer Type
Automatic

Driller
JO

Energy Transfer Ratio (%)
84.10

Logged By
JH

Start Date
10/23/2026

Completion Date
10/23/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766140° Longitude: -100.804890°

BORING LOG NO. B-05

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI
1		0.5	**TOPSOIL**, dark brown		97.5									
		1.0	**ROOT ZONE**, dark brown		97.0		5		1-2-2 N = 4	19.3				
4			**FAT CLAY (CH)**, brown, medium stiff		96.5									
							3		3-4-4 N = 8	19.8				
		3.5			94.0									
2			**LEAN CLAY (CL)**, brown to gray, soft to medium stiff, silty texture											
				5			2		3-3-2 N = 5	14.2				
							6		1-1-1 N = 2	30.2		37	23	14
				10			6		1-1-1 N = 2	31.9				
							10		WoH-1-2 N = 3	31.1	94			
				15			10		WoH-1-3 N = 4	35.5				
		19.0			78.5									
5			**SILTY SAND (SM)**, fine to coarse grained sand, brownish gray, very loose to loose, waterbearing	20			10	▽	WoH-2-1 N = 3	27.8				
				25			10		WoH-1-3 N = 4	35.5				
			Boring Terminated at 26 ft.											

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
▽ 20 Ft. While drilling

Advancement Method
0-24.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57

Hammer Type
Automatic

Driller
JO

Energy Transfer Ratio (%)
84.10

Logged By
JH

Start Date
10/23/2026

Completion Date
10/23/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766140° Longitude: -100.804690°

BORING LOG NO. B-06

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Percent Fines	Atterberg Limits LL	PL	PI
1		0.5	**TOPSOIL**, dark brown		97.5											
		1.0	**ROOT ZONE**, dark brown		97.0		8		5-5-4 N = 9		12.9					
4			**FAT CLAY (CH)**, brown, stiff		96.5											
							8		5-6-5 N = 11					56	21	35
		3.5			94.0											
2			**LEAN CLAY (CL)**, brown, medium stiff													
				5			2		4-3-3 N = 6		22.2					
		7.0			90.5											
3			**SILT (ML)**, brown, moist to wet, soft, waterbearing				10		1-2-2 N = 4		28.5			NP	NP	NP
				10			10		1-1-2 N = 3		28.7		95			
		12.0			85.5											
2			**LEAN CLAY (CL)**, brownish gray, soft to medium stiff							1330	31.4	94	98	41	19	22
				15			18		WoH-1-1 N = 2		34.3					
		19.0			78.5											
3			**SANDY SILT (ML)**, brownish gray, moist to wet, very soft, waterbearing	20			16		WoH-1-WoH N = 1		32.4					
		24.0			73.5											
5			**SILTY SAND (SM)**, fine to coarse grained sand, brownish gray, very loose, waterbearing	25			10		WoH-1-1 N = 2		31.1					
			Boring Terminated at 26 ft.													

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
25 Ft. While drilling
7 Ft. 2026-11-03
19.5 Ft. 2026-11-03

Advancement Method
0-24.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57

Hammer Type
Automatic

Driller
JO

Energy Transfer Ratio (%)
84.10

Logged By
JH

Start Date
10/23/2026

Completion Date
10/23/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.766500° Longitude: -100.804800°

BORING LOG NO. B-07

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
		0.2	**TOPSOIL**, dark brown		97.5									
		0.7	**ROOT ZONE**, dark brown		97.3									
4			**FAT CLAY (CH)**, brown, stiff		96.8		14		3-4-6 N = 10	16.8				
		2.0			95.5									
2			**LEAN CLAY (CL)**, brown, soft to stiff				9		6-7-7 N = 14	15.8				
											98	48	16	32
				5			15		3-4-4 N = 8	15.2				
							13		WoH-1-2 N = 3	29.8				
3		9.0	**SANDY SILT (ML)**, brown, moist to wet, soft, waterbearing		88.5			▽						
				10			13		1-1-2 N = 3	30.8				
		12.0			85.5									
2			**LEAN CLAY (CL)**, grayish brown to gray, soft to medium stiff				12		WoH-1-3 N = 4	24.4				
				15			18		2-2-3 N = 5	33.0				
			Boring Terminated at 16 ft.											

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
Groundwater not encountered while drilling
▽ 9.5 Ft. 2026-11-03

Advancement Method
0-14.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
1174/Mobile B-57

Hammer Type
Automatic

Driller
JO

Energy Transfer Ratio (%)
84.10

Logged By
JH

Start Date
10/30/2026

Completion Date
10/30/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr., Bismarck, ND, 58504,USA
Terracon Project No. 1000071643

Latitude: 46.765960° Longitude: -100.804870°

BORING LOG NO. B-08

Terracon
1502 Grumman Lane
Suite 4
Bismarck, ND 58504-6070

Surface Elevation:
97.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)
		0.1	**TOPSOIL**, dark brown		97.5						
		0.6	**ROOT ZONE**, dark brown		97.4						
4			**FAT CLAY (CH)**, brown, medium stiff to very stiff, organics to approximately 2 ft		96.9		10		5-4-4 N = 8	14.0	
							7		6-8-8 N = 16	17.8	
		3.5			94.0						
2			**LEAN CLAY (CL)**, brownish gray to gray, soft to medium stiff								
				5			9		3-4-3 N = 7	20.1	95
							4		1-2-2 N = 4	15.1	
				10			8		3-2-1 N = 3	25.3	
		12.0			85.5			▽			
			waterbearing seams of silt at 12 ft				18		WoH-1-2 N = 3	31.1	
				15			18		WoH-2-2 N = 4	36.4	
			Boring Terminated at 16 ft.								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations were measured in the field using an engineer's level and grade rod.
Location Comment: Benchmark (TBM) – Top nut of fire hydrant in the NW quadrant of Burleigh Ave. and Calypso Dr.
TBM Elev. 100.0 (assigned)
Lat: 46.7658° N
Long: 100.8055° W

Water Level Observations
Groundwater not encountered while drilling
▽ 12 Ft. 2026-11-03

Advancement Method
0-14.5 Ft. 3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

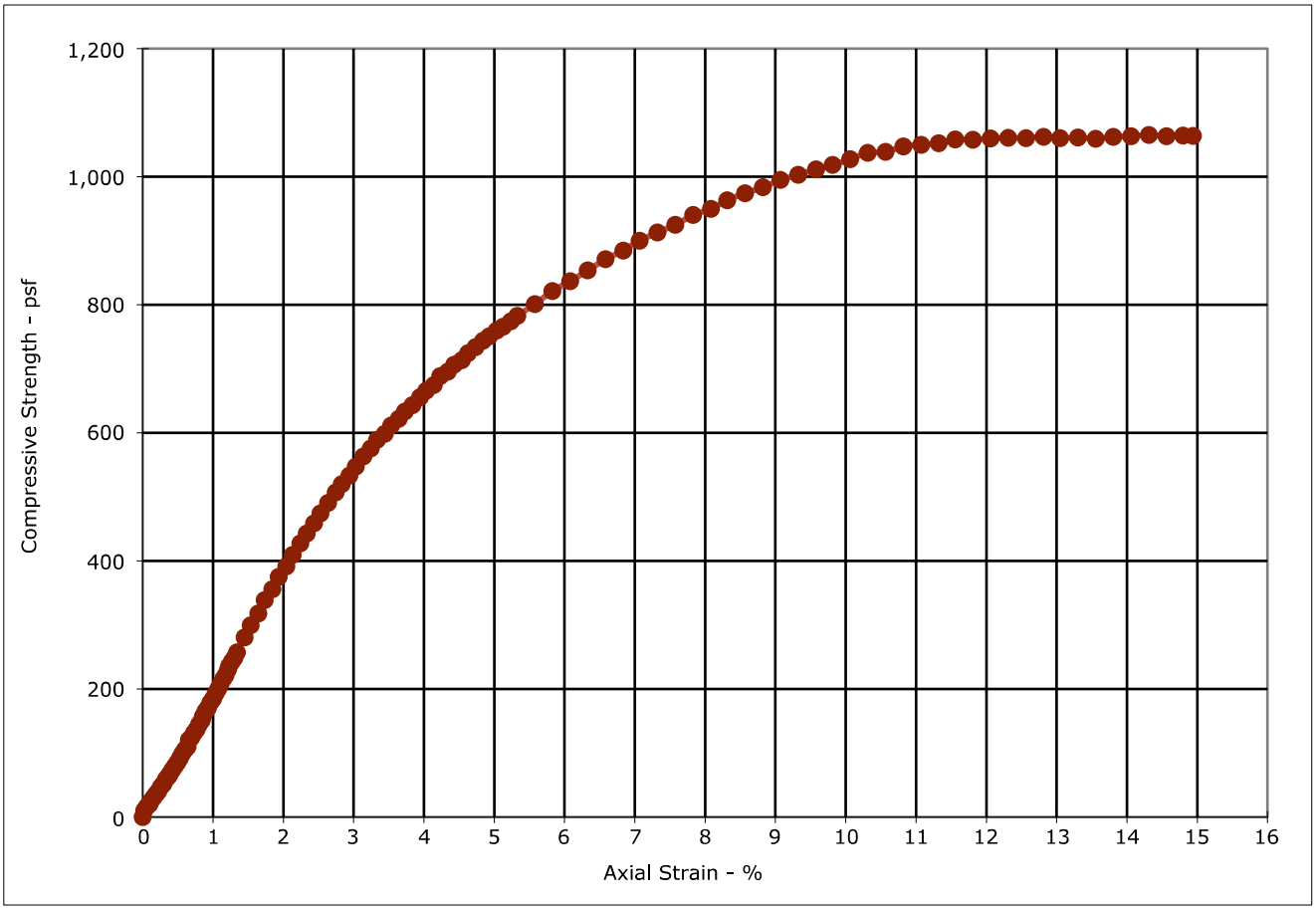
Equipment
1174/Mobile B-57
Hammer Type
Automatic
Driller
JO
Energy Transfer Ratio (%)
84.10
Logged By
JH
Start Date
10/30/2026
Completion Date
10/13/2026

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr. | Bismarck, NI
Terracon Project No. 1000071643

Terracon
1502 Grumman Ln, Ste 1
Bismarck, ND 58504

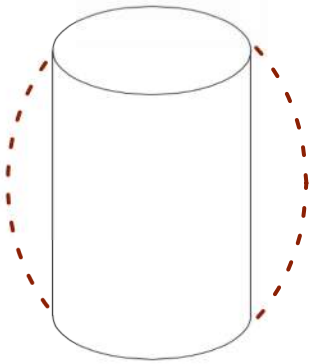
Unconfined Compressive Strength of Cohesive Soil

ASTM D2166



Boring ID	Depth (Ft)	Sample Type	LL	PL	PI	USCS	Fines (%)	Description
B-04	14.5 - 16.5	Intact	38	20	18	CL	99	Lean Clay

Specimen Failure Mode



Specimen Test Data

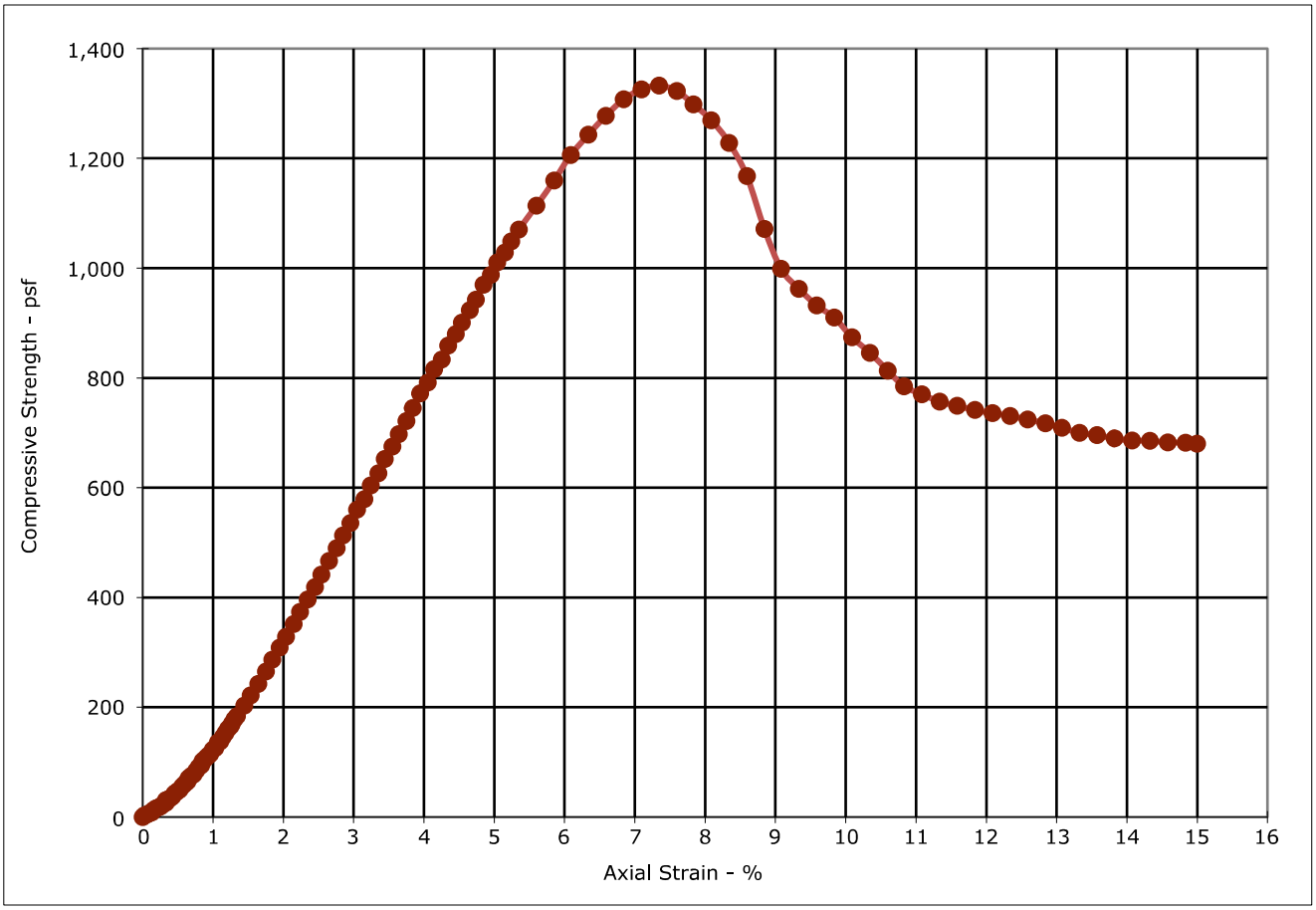
Water Content (%):	30.4
Dry Density (pcf):	93.1
Diameter (in.):	2.78
Height (in.):	5.59
Height / Diameter Ratio:	2.01
Calculated Saturation (%):	101.3
Calculated Void Ratio:	0.81
Assumed Specific Gravity:	2.7
Failure Strain (%):	14.3
Unconfined Compressive Strength (psf):	1060
Undrained Shear Strength (psf):	530
Strain Rate (%/min):	2.0

Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr. | Bismarck, NI
Terracon Project No. 1000071643

Terracon
1502 Grumman Ln, Ste 1
Bismarck, ND 58504

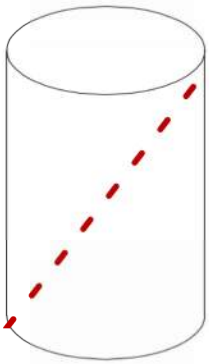
Unconfined Compressive Strength of Cohesive Soil

ASTM D2166



Boring ID	Depth (Ft)	Sample Type	LL	PL	PI	USCS	Fines (%)	Description
B-06	12 - 14	Intact	41	19	22	CL	98	Lean Clay

Specimen Failure Mode



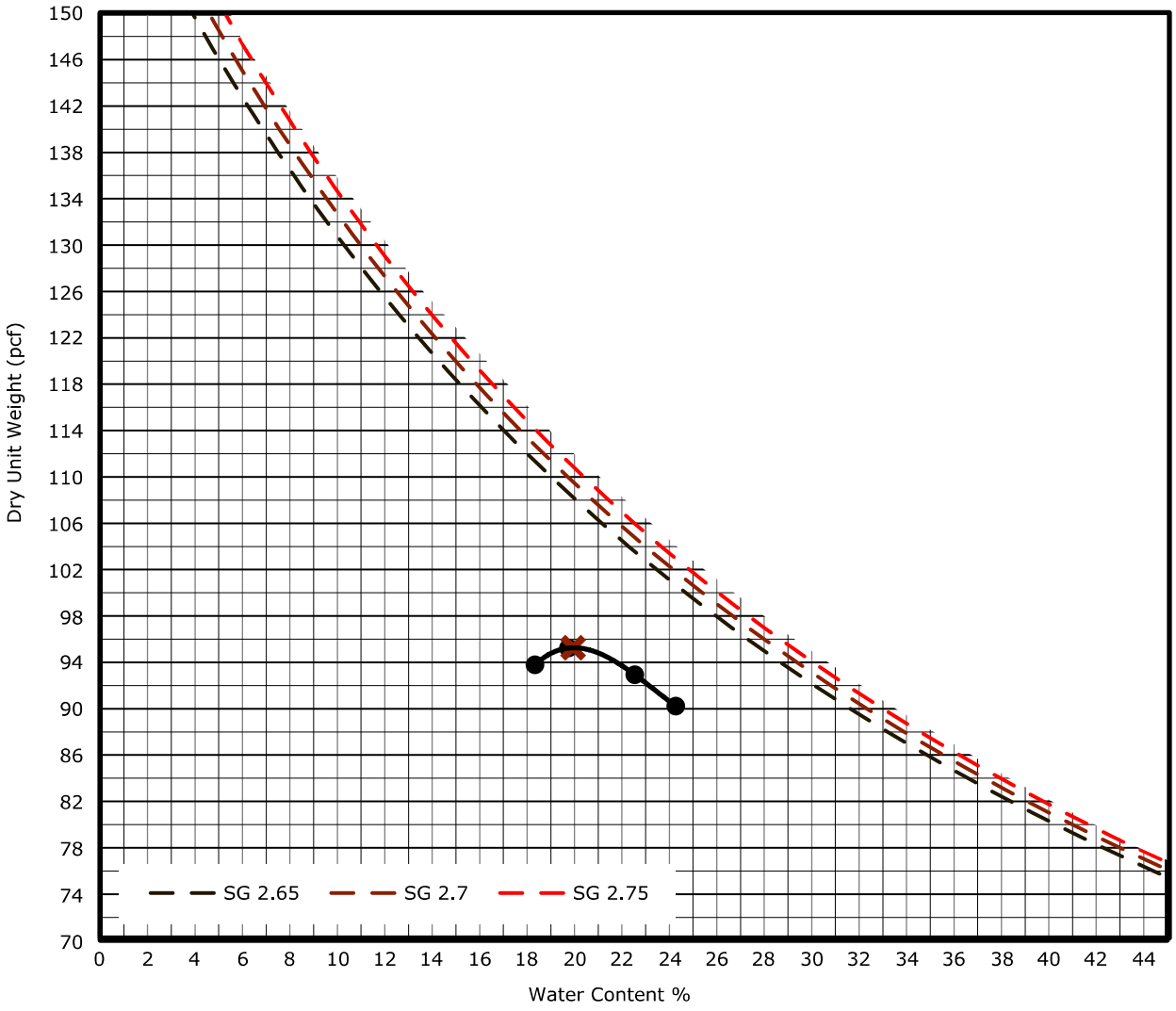
Specimen Test Data

Water Content (%):	31.4
Dry Density (pcf):	94.1
Diameter (in.):	2.77
Height (in.):	5.58
Height / Diameter Ratio:	2.01
Calculated Saturation (%):	107.0
Calculated Void Ratio:	0.79
Assumed Specific Gravity:	2.7
Failure Strain (%):	7.3
Unconfined Compressive Strength (psf):	1330
Undrained Shear Strength (psf):	665
Strain Rate (%/min):	2.0

Terracon
1502 Grumman Ln, Ste 1
Bismarck, ND 58504

Laboratory Compaction Characteristics of Soil Using Standard Effort

ASTM D698



Boring ID	Depth (ft)	Description of Material	USCS	LL	PL	PI
B-07	1 - 6	Lean Clay	CL	48	16	32

Test Designation/Method	Rammer	Fines (%)	Sample Prep	Maximum Dry Density (pcf)	Optimum Water Content (%)
D698 / Method A	Manual - Circular Face	98.0	Dry	95.1	19.9

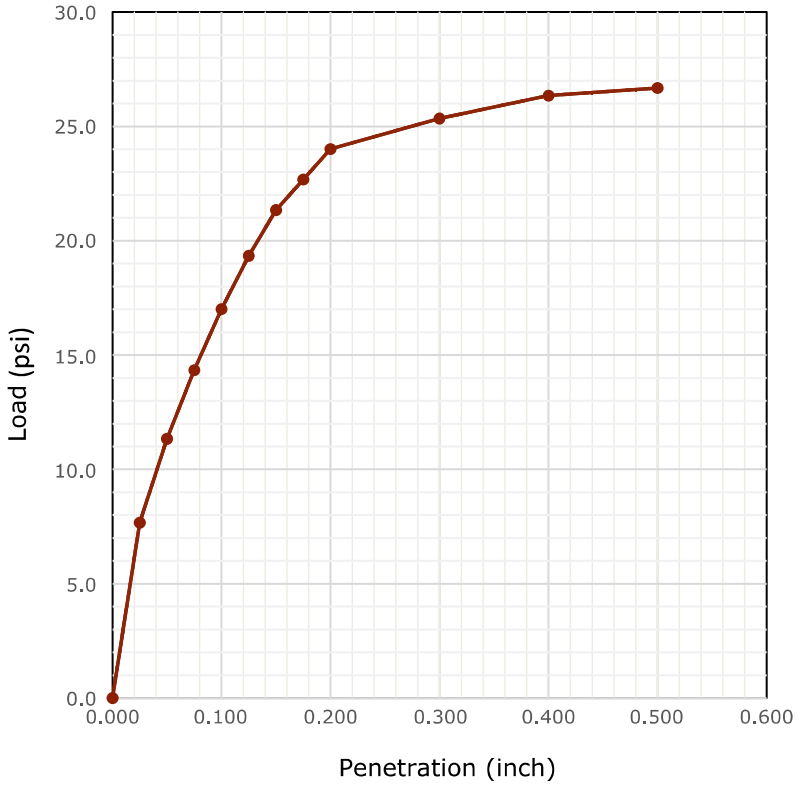
Bismarck Fire Station 6
North side of the intersection of Burleigh Ave. and Calypso Dr. | Bismarck, NI
Terracon Project No. 1000071643

Terracon
1502 Grumman Ln, Ste 1
Bismarck, ND 58504

California Bearing Ratio

ASTM D1883 - 1 PT Method

Sample Information					
Boring ID / Depth	B-07 / 1 - 6			**Proctor Method**	D698
Percent Fines	97.6			**Optimum Moisture**	19.9
Atterberg Limits	**LL**	**PL**	**PI**	**Maximum Dry Density (pcf)**	95.1
	48	16	32		
Description of Material	Lean Clay			**Sample Condition**	Soaked



CBR Test Data	
Length of Soaking (hours)	96
Surcharge Weight (lbs)	10
Dry Density Before Soak (pcf)	91.4
Compaction of Proctor (%)	96.1
Moisture After Comp. (%)	16.5
Top 1" After Soaking (%)	29.5
Swell (%)	4.6
CBR Value at 0.100 inch	2
CBR Value at 0.200 inch	2
Remarks:	

Supporting Information

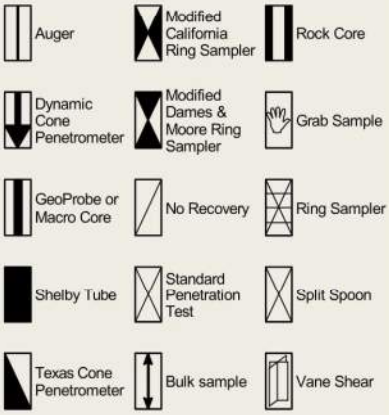
Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

Sampling



Descriptive Soil Classification

Standard Practice for soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with *2025 ASTM D2487 Classification of Soils for Engineering Purposes* this procedure is used. The 2026 *ASTM D2488 Description and Identification of Soils*(Visual-Manual Procedures) is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with *ASTM D2487*. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to the methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Field/Lab Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
HP	Hand Penetrometer
T	Torvane
DCP	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
UU	Unconsolidated Undrained
PID	Photo-Ionization Detector
OVA	Organic Vapor Analyzer
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
WOH	Weight Of Hammer
WOR	Weight Of Rod
VS	Vane Shear

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the log report in the form of latitude and longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicate that no actual topographical survey was conducted to confirm the surface elevation. Instead, the approximate surface elevation was determined from available topographic information for the area.

Water Level



Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate evaluation of groundwater levels is not possible with short-term water level observations.

Units

Water Content	%
Fines	%
HP	tsf
Unit Weight	pcf
Dry Unit Weight	pcf
Unconfined Compressive Strength-soil	psf
Unconfined Compressive Strength-rock	psf
Strain	%
Confining Pressure	psi
PID	ppm

Strength Terms

In accordance with *ASTM D1586* and correlations presented by *Terzaghi and Peck (1948)*.

Relative Density of Coarse-Grained Soils

(More than 50% retained on No. 200 sieve.)
Density determined by standard penetration resistance.

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils

(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance.

Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 0.25	0 - 2
Soft	0.25 to 0.50	3 - 4
Medium Stiff	0.50 to 1.00	5 - 8
Stiff	1.00 to 2.00	9 - 15
Very Stiff	2.00 to 4.00	16 - 30
Hard	> 4.00	> 30

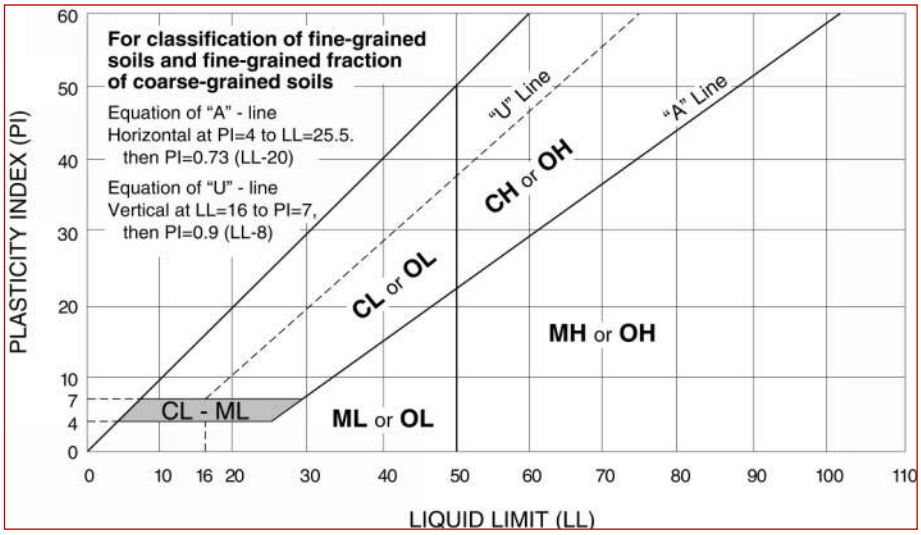
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



BID FORM

PROJECT:	Fire Station #6 Burleigh Ave & Calypso Dr. Bismarck, ND
BID CLOSING TIME:	Thursday December 3, 2026 @ 3:00pm CST
BID OPENING TIME:	Thursday December 3, 2026 @ 4:00 pm CST
BID OPENING PLACE:	4th Floor Mayor's Conference Room - City / County Bldg. 221 N 5th Street Bismarck, ND 58501
TO THE OWNER:	City of Bismarck 221 N 5th Street Bismarck, ND 58501

I have received the Drawings and Specifications for the _____ Contract for EAPC Project No. 20253510, Fire Station #6, to be erected at Bismarck, North Dakota.

I have also received Addenda Nos. _____ and have included their provisions in my Bid. I have examined both the documents and the site and submit the following Bid:

I will do the _____(GC or MC or EC or Combined) Construction Work for the lump sum price of

_____ dollars ($_____).

ALTERNATIVES.

I will include the following alternates as specified additions to or deductions from the above Base Bid, for changes in dollars and time listed:

Alternate No. 1, Four-Folding doors

ADD $_____

ADD _____Calendar Days.

unit costs

I will include authorized unit cost work as specified to be added to or deducted from the above Base Bid, for changes in dollars and time listed:

Unit Cost No. 1, Removal of unsatisfactory soil and replacement with satisfactory soil material - per CY

ADD $_____

ADD _____Calendar Days.

In submitting this Bid, I agree:

1. To hold my bid open for (60) calendar days after its' opening.
2. To accept the provisions of the Instructions to Bidders regarding disposition of Bid Security.
3. To enter into and execute a Contract, if awarded on the basis of this bid, and to furnish Guarantee Bonds in accord with the Instructions to Bidders.
4. To accomplish the work in accord with the Contract Documents.
5. To substantially complete the Work in the Base Bid according to the following schedule:
   To substantially complete the Work in the Base Bid by April 1, 2028 from date of Notice to Proceed.

I have attached the required Bid Security.

I have listed below the major Subcontractors whose bids I have used in submitting this Bid:
Plumbing
Heating, Ventilating, Air Conditioning
Electrical

Official Address: _____ Firm Name

_____ _____ signed by

_____ _____ title

END OF SECTION 00 3000.1

SECTION 07 2119 - FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In underside of roofs and ceilings.

1.2 REFERENCE STANDARDS

A. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

D. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

1.3 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

C. Certificates: Certify that products of this section meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

E. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Water Vapor Permeance: Vapor retarder; 1.0 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
   2. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
   3. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
   4. Closed Cell Content: At least 90 percent.
   5. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
   6. Other Acceptable Products:
      a. BASF Corporation: www.spf.basf.com/#sle.
      b. Henry Company: www.henry.com/#sle.
      c. Johns Manville: www.jm.com/#sle.

2.2 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify work within construction spaces or crevices is complete before insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.3 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Trim excess away for applied materials or remove as required for continuous sealant bead.

3.4 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2119

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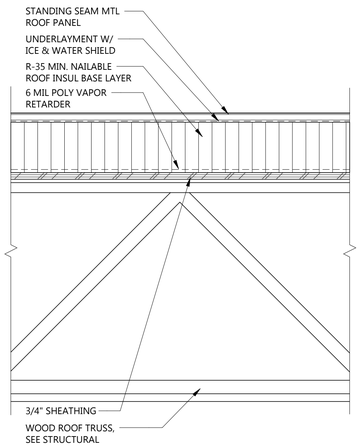
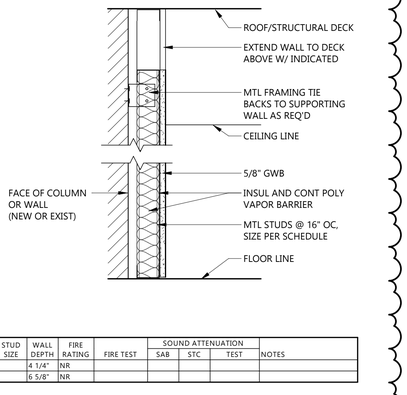
ROOF TYPE - LIVING QUARTERS



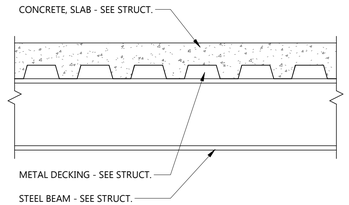
R2 ROOF TYPE TITLE

DELETE BOUNDARY



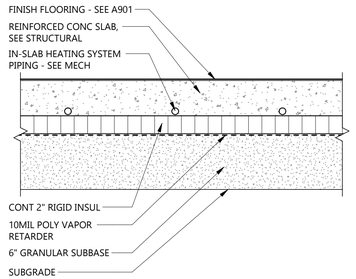
TYPE MARK	STUD SIZE	WALL DEPTH	FIRE RATING	FIRE TEST	SOUND ATTENUATION			NOTES
					SAB	STC	TEST	
J4		4 1/4"	NR					
J7		6 5/8"	NR					

J NON-RATED METAL STUD FURRED WALL



F2 FLOOR ASSEMBLY TYPE R2

(TYPICAL AT MEZZANINE)



F1 FLOOR ASSEMBLY TYPE R1

(TYPICAL AT HEATED SLAB AREAS)

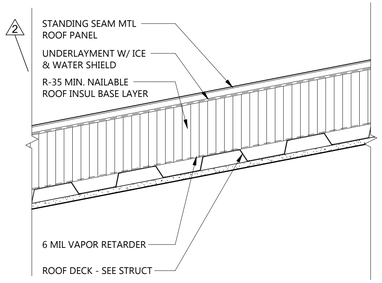
GENERAL INTERIOR PARTITION NOTES

1. SEE FLOOR PLANS FOR EXTENT OF EACH WALL
2. ON ALL RESTROOM WALLS AND OTHER AREAS SCHEDULED TO RECEIVE FRP OR TILE FINISH, PROVIDE A MINIMUM OF MOISTURE-RESISTANT GYPSUM BOARD.
3. ALL PARTITIONS CONTAINING PLUMBING OR HAVING AN EXTERIOR FACE SHALL BE INSULATED.
4. WHERE GYPSUM BOARD EXTENDS TO UNDERSIDE OF STRUCTURE ABOVE, STOP GYPSUM BOARD 1/2" BELOW LINE OF STRUCTURE AND SEAL AS REQUIRED.
5. REFERENCE FLOOR FINISH PLANS AND WALL FINISH PLANS FOR ADDITIONAL FINISHES NOT INDICATED ON PARTITION TYPES.
6. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS OF WALL PENETRATIONS. SEAL ALL OPENINGS WITH ACOUSTICAL SEALANT.
7. PROVIDE FIRE-TREATED WOOD OR STEEL BACKING FOR ALL WALL-MOUNTED FINISH CARPENTRY, ARCHITECTURAL WOODWORK, TOILET PARTITIONS, ACCESSORIES AND OTHER SIMILAR ITEMS.

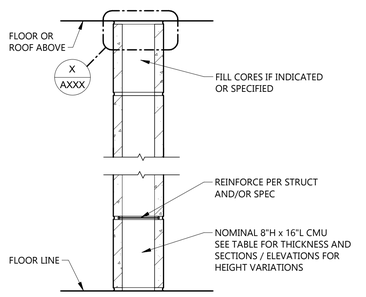
FIRE-RATED PARTITION NOTES:

1. ALL PARTITIONS NOTED TO BE FIRE-RESISTANCE RATED SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH THE FIRE RESISTANCE TESTS.
2. FIRE-RATED PARTITIONS SHALL BE CONSTRUCTED BEFORE NON-RATED PARTITIONS.
3. ALL FIRE-RATED PARTITIONS TO EXTEND FROM TOP OF UNFINISHED FLOOR TO UNDERSIDE OF STRUCTURE ABOVE. SEAL TOP, BOTTOM AND ALL PENETRATIONS WITH FIRE-RATED SEALANT.
4. ALL PENETRATIONS IN FIRE-RATED PARTITIONS SHALL BE SEALED WITH MATERIALS, SEALANTS AND/OR ASSEMBLIES WHICH MAINTAIN THE FIRE-RESISTANCE RATING OF THE PARTITION

ROOF TYPE x

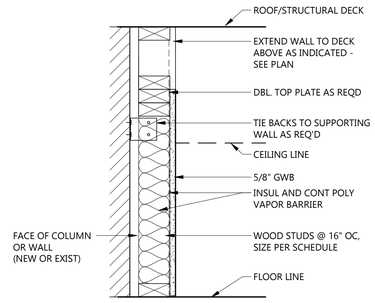


R1 ROOF TYPE



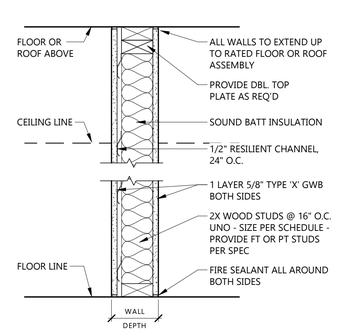
TYPE MARK	STUD SIZE	WALL DEPTH	FIRE RATING	FIRE TEST	SOUND ATTENUATION			NOTES
					SAB	STC	TEST	
M4		3 5/8"						
M8		7 5/8"	1-HR	U906				
MC		11 5/8"	1-HR	U906				

M MASONRY PARTITION (SINGLE WYTHE CMU)



TYPE MARK	STUD SIZE	WALL DEPTH	FIRE RATING	FIRE TEST	SOUND ATTENUATION			NOTES
					SAB	STC	TEST	
K4	3 1/2"	4 1/8"	NR					
K6	5 1/2"	6 1/8"	NR					

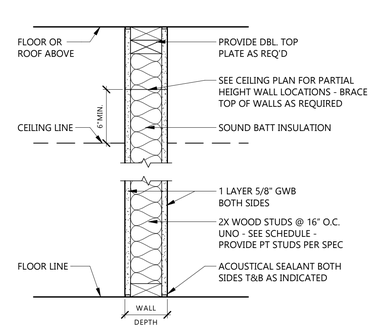
K NON-RATED WOOD STUD FURRED WALL



TYPE MARK	STUD SIZE	WALL DEPTH	FIRE RATING	FIRE TEST	SOUND ATTENUATION			NOTES
					SAB	STC	TEST	
D5	3 1/2"	4 3/4"	1-HR FB	UL U305	-	-	-	2X4
D7	5 1/2"	6 3/4"	1-HR FB	UL U305	-	-	-	2X6
D9	7 1/4"	8 1/2"	1-HR FB	UL U305	-	-	-	2X8

SEE LIFE SAFETY PLAN FOR 1/2-HOUR F.R. ASSEMBLY TYPES AND LOCATIONS

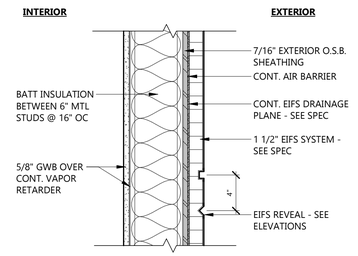
D 1/2-HOUR RATED GWB ON WOOD STUDS



TYPE MARK	STUD SIZE	WALL DEPTH	FIRE RATING	FIRE TEST	SOUND ATTENUATION			NOTES
					SAB	STC	TEST	
B5	3 1/2"	4 3/4"	NR	-	3 1/2"	-	-	2x4
B7	5 1/2"	6 3/4"	NR	-	5 1/2"	-	-	2x6
B9	7 1/4"	8 1/2"	NR	-	5 1/2"	-	-	2x8

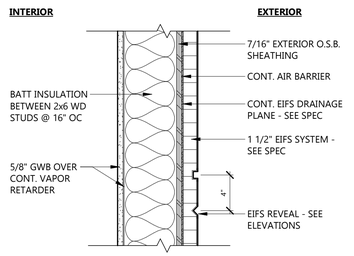
SEE LIFE SAFETY PLAN FOR N.R. SMOKE-RESISTIVE WALL LOCATIONS

B NON-RATED GWB ON WOOD STUDS



SEE ELEVATIONS FOR EIFS REVEALS AND JOINTS

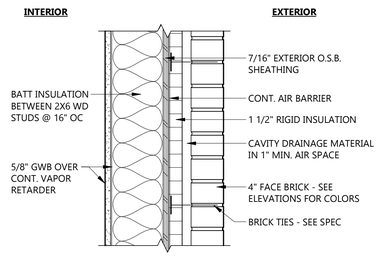
E5 EIFS ON MTL STUD BACKUP



SEE ELEVATIONS FOR EIFS REVEALS AND JOINTS

E4.2 - BATT INSULATION BETWEEN 2X8 WD STUDS @ 16" OC

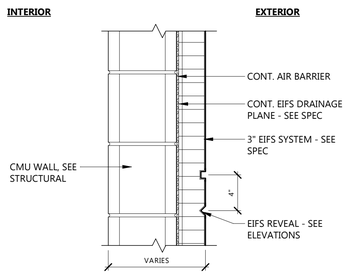
E4.1 EIFS ON WOOD STUD BACKUP



SEE ELEVATIONS AND SECTIONS FOR BRICK COURSING

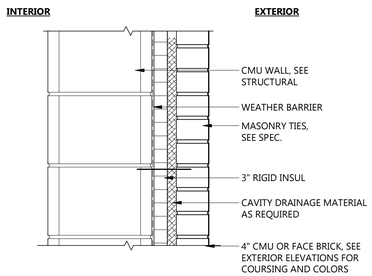
E3.2 - BATT INSULATION BETWEEN 2X8 WD STUDS @ 16" OC

E3.1 EXTERIOR BRICK ON WD STUD BACKUP



SEE ELEVATIONS FOR EIFS REVEALS AND JOINTS

E2 EIFS ON CMU BACKUP



SEE EXTERIOR ELEVATIONS AND SECTIONS FOR COURSING

E1 EXTERIOR BRICK ON CMU BACKUP

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BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARCK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
3	ADDENDUM #3	11/17/2026
2	ADDENDUM #2	11/13/2026
1	ADDENDUM #1	11/05/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2026

PROJECT NO: 20253510
DRAWN BY: MS
CHECKED BY: BD

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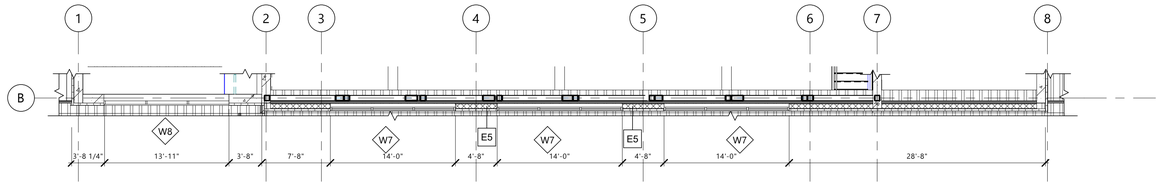
Signature:
Date: 10/29/2026 REG. NO. : 1718

DRAWING TITLE
WALL, FLOOR AND ROOF TYPES

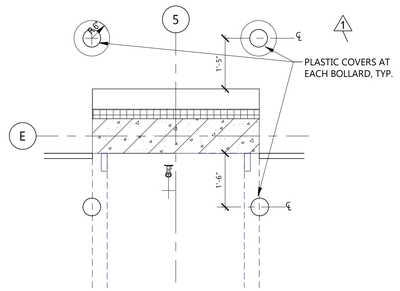
A021

Revit Version: 2025
Plot Date: 11/17/2026 10:58:56 AM



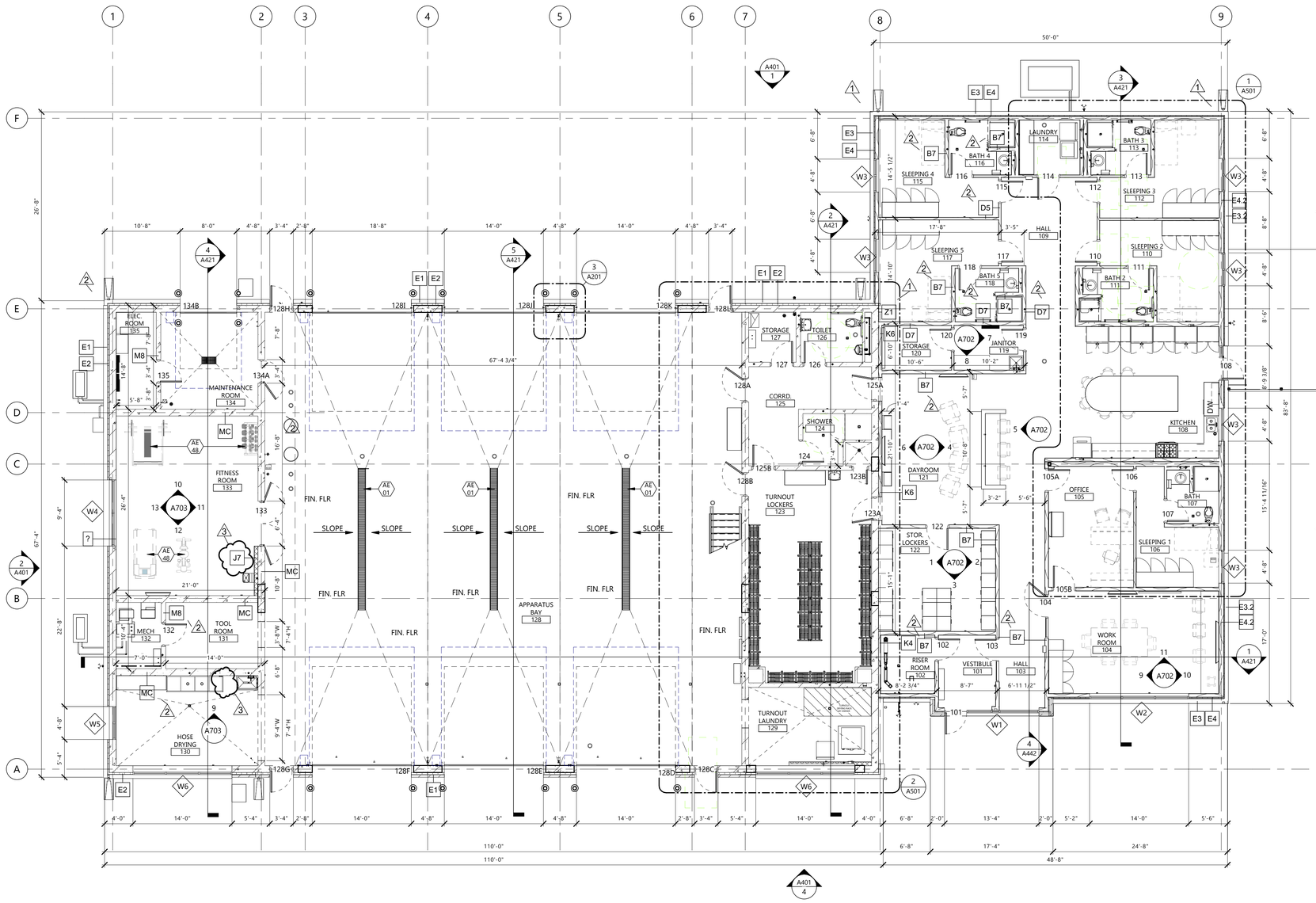
4 A201 APPARTUS CLERESTORY - RIBBON WINDOW PLAN

1/8" = 1'-0"



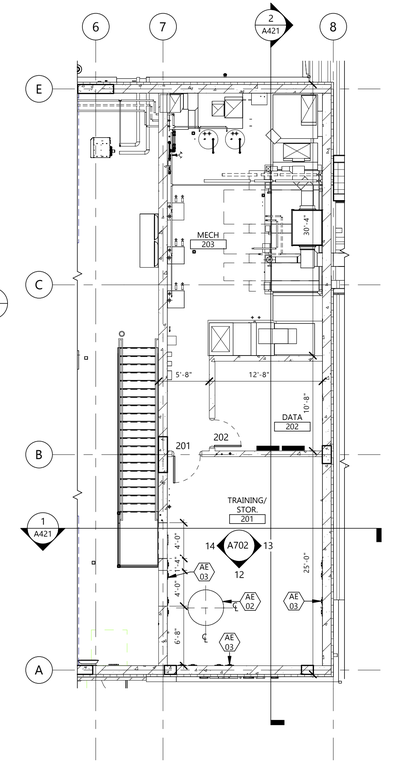
3 A201 TYP. BOLLARD PLAN DETAIL

1/2" = 1'-0"



2 A201 FIRST FLOOR PLAN

1/8" = 1'-0"



1 A201 MEZZANINE FLOOR PLAN

1/8" = 1'-0"

GENERAL NOTES

1. GENERAL NOTES APPLY TO ALL DRAWING SETS
2. SUBCONTRACTORS FOR EACH TRADE ARE ADVISED THAT INFORMATION PERTINENT TO THEIR WORK MAY OCCUR IN OTHER PORTIONS OF THE CONTRACT DOCUMENTS. ALL NOTES ARE TO BE REVIEWED AND APPLIED TO RELATED BUILDINGS DOCUMENTS.
3. CROSS REFERENCES SHOWN ON DRAWINGS DO NOT NECESSARILY INDICATE ALL LIKE CONDITIONS AND DO NOT LIMIT APPLICATION OF ANY DRAWING OF DETAIL WHERE SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED, CONSULT THE ARCHITECT PRIOR TO PROCEEDING WITH WORK.
4. REVIEW SPECIFICATIONS FOR INSTRUCTIONS NOT SHOWN ON DRAWINGS. INFORMATION COMMON TO SEVERAL DRAWINGS MAY BE NOTED ON ONLY ONE. CONTRACTOR IS RESPONSIBLE FOR ENTIRE SET OF DOCUMENTS.
5. DIMENSIONS AT INTERIOR CMU BLOCK PARTITIONS ARE TO FACE OF WALL TO FACE OF WALL. DIMENSIONS AT INTERIOR STUD PARTITIONS ARE TO THE CENTER OF THE WALL UNLESS NOTED OTHERWISE.
6. DRAWINGS ARE NOT TO BE SCALED. CONTRACTOR TO VERIFY ALL DIMENSIONS & FIELD CONDITIONS PRIOR TO COMMENCING THE WORK.
7. REFER TO INTERIORS SHEET A901 FOR CORNER GUARD LOCATIONS AND DETAILS, FOR WALL PROTECTION AND HAND RAIL LOCATIONS AND DETAILS.
8. CAULK ALL COUNTERTOPS, BACKSPLASHES & CABINETS AT LOCATIONS WHERE THEY MEET WALL. SEAL ALL CUT-OUTS IN COUNTERTOPS.
9. ALL PIPING, CONDUITS, &RELATED MECHANICAL & ELECTRICAL ITEMS SHALL BE CONCEALED WITHIN DRYWALL AND/OR PLASTER FURRING AS REQUIRED IN FINISHED AREAS WHETHER SHOWN ON DRAWINGS OR NOT UNLESS OTHERWISE NOTED.
10. SEAL AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT PENETRATIONS AT RATED WALLS, ABOVE & BELOW CEILINGS, WITH A UL APPROVED FIRE-STOPPING MATERIAL - SEE SPECIFICATIONS.
11. WHEN WALL PARTITIONS OF DIFFERENT RATING INTERSECT, THE HIGHEST RATED PARTITIONS TAKE PRECEDENT.
12. ALL FURNITURE FOR REFERENCE ONLY (SHOWN DASHED) WILL BE OWNER FURNISHED & OWNER INSTALLED.
13. RADIUS EXPOSED COUNTERTOP CORNERS 2" RADIUS TYPICALLY. (2" WHERE 3MM EDGE BANDING, 1" RADIUS AT SSF EDGES.) U.N.O.
14. WALLS ARE TYPE 'B5' WALL PARTITIONS WITHIN THE OFFICE AREA AND LIVING QUARTERS; 'M8' WITHIN APPARATUS, TURNOUT, AND GEAR STORAGE UNLESS NOTED OTHERWISE. SEE WALL TYPES SHEET A021.
15. REFER TO LIFE SAFETY PLANS AND FLOOR PLANS FOR LOCATION OF REQUIRED FIRE WALLS.
16. REFER TO ELEVATIONS FOR WALL MOUNTED EQUIPMENT. PROVIDE IN-WALL BLOCKING AS REQUIRED
17. FLOOR ELEVATION 100'-0" = 39.50 ON CIVIL DRAWINGS.

KEYNOTE LEGEND:

< < < INDICATES KEYNOTE ON PLAN

AE 01 TRENCH DRAIN, SEE P201, P501, AND P801 FOR ADDITIONAL INFORMATION.

AE 02 MANHOLD (NEENAH R-1792-JL) IN MEZZANINE FLOOR, SEE 6/S701 FOR ADDITIONAL INFORMATION.

AE 03 TRAINING TIE-OFF ATTACHMENT, SEE 7/S702 FOR ADDITIONAL INFORMATION COODINATE FINAL LOCATION WITH OWNER AND MANHOLE LOCATION.

AE 48 FITNESS ROOM EQUIPMENT, OWNER PROVIDED BY ALLOWANCE 1, SEE SPEC.

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BISMARCK FIRE DEPARTMENT

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FIRE STATION 6

CITY BISMARCK
STATE ND

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PROJECT NO: 20253510
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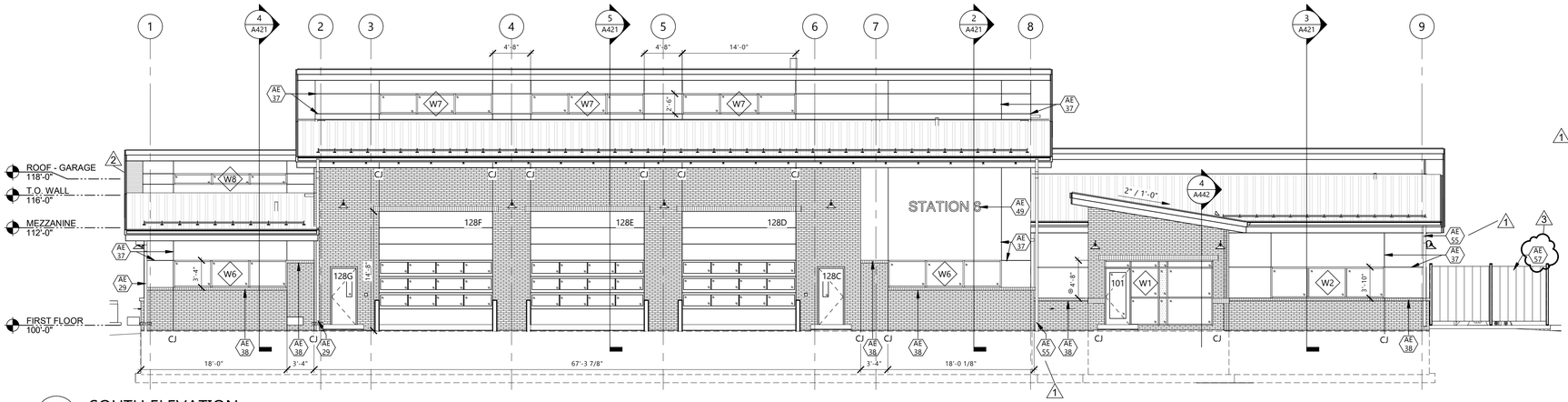
Signature:
Date: 10/29/2026 REG. NO. : 1718

DRAWING TITLE
FLOOR PLANS

A201

Revit Version: 2025
Plot Date: 11/7/2026 10:59:01 AM



4 A401 SOUTH ELEVATION

1/8" = 1'-0"

KEYNOTE LEGEND:

< < < INDICATES KEYNOTE ON PLAN

AE 27 SNOW GUARDS, SEE SPECS FOR ADDITIONAL INFO.

AE 29 PRE-FINISHED DOWNSPOUT AND CONCRETE SPLASHBLOCK.

AE 37 1"w X 1/2"d RECESSED 'V' REVEAL.

AE 38 BRICK ROWLOCK CAP.

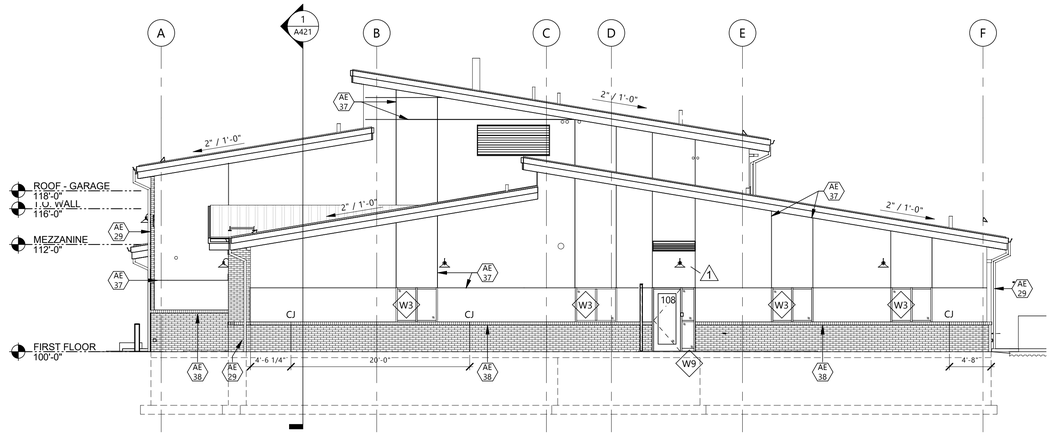
AE 49 15" TALL LETTERS, BLACK.

AE 55 PRE-FINISHED DOWNSPOUT. COORD. WITH CIVIL TO CONNECT WITH TRENCH DRAIN.

AE 57 INSTALL A 6' VINYL FENCE SCREEN AS DEPICTED ON PLAN. BOTTOM RAIL OF FENCE SHALL BE A MAX OF 1" FROM CONCRETE. POST FOOTINGS SHALL BE 4' DEEP, 12" DIAMETER. FENCING SHALL BE A 6' PVC CHESTERFIELD WITH CERTAGRAIN TEXTURE AS MANUFACTURED BY CERTAINTEED CORPORATION, OR APPROVED EQUAL. COLOR: NATURAL CLAY.

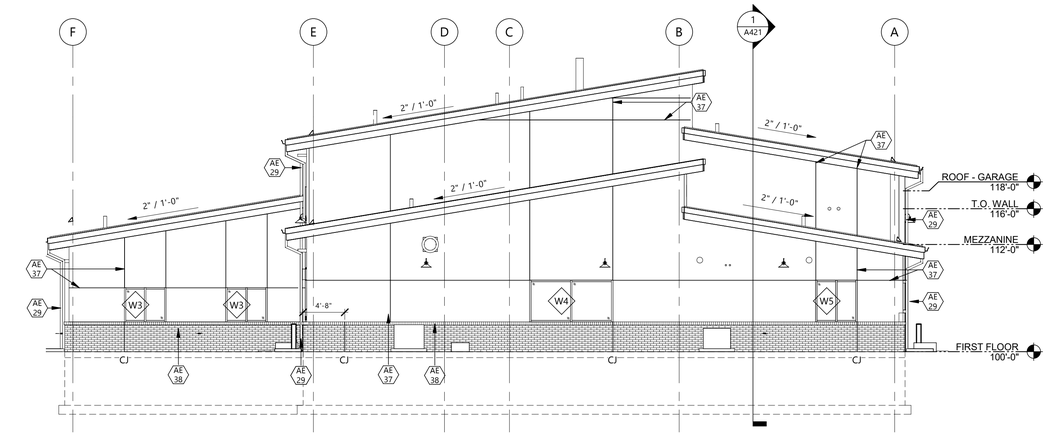
MATERIALS LEGEND

	COMMON	SOLDIER	STACKED	HEADER
UTILITY BRICK - HEBRON, SEE AREAS FOR COLORS				
CONCRETE				
PANEL 1				
EIFS				



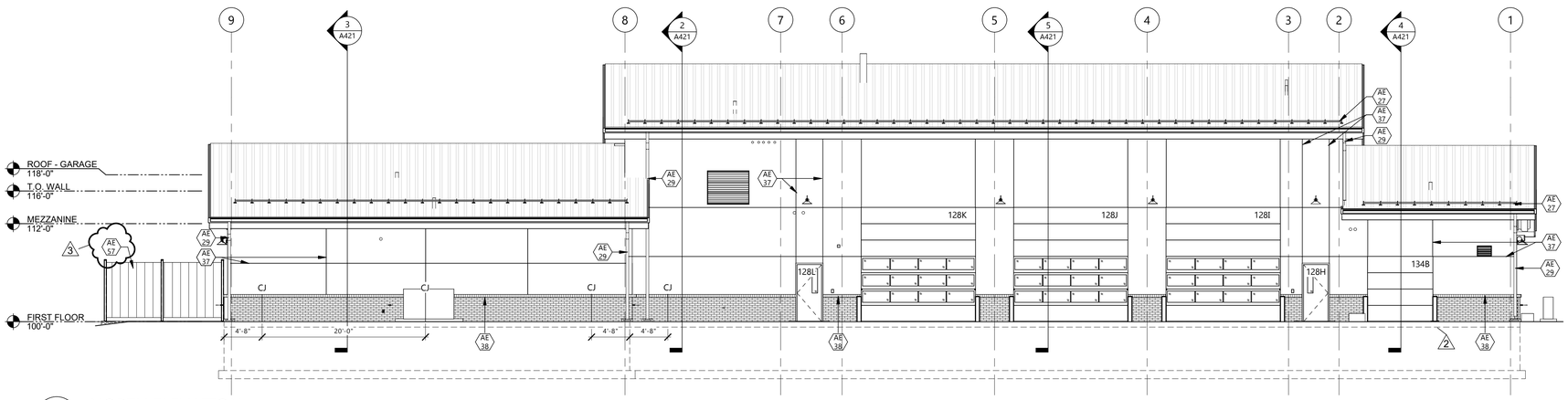
3 A401 EAST ELEVATION

1/8" = 1'-0"



2 A401 WEST ELEVATION

1/8" = 1'-0"



1 A401 NORTH ELEVATION

1/8" = 1'-0"

Revit Version: 2025
Plot Date: 11/17/2026 10:59:04 AM

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PROJECT NO: 20253510
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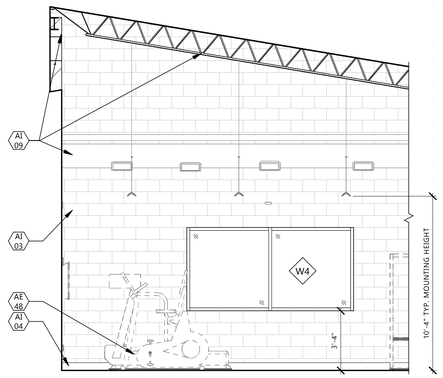
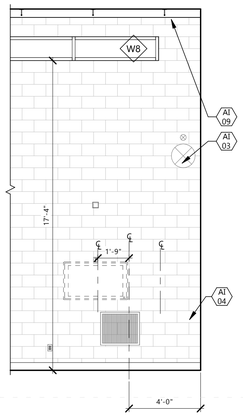
Date: 10/29/2026 REG. NO. : 1718

DRAWING TITLE
BUILDING ELEVATIONS

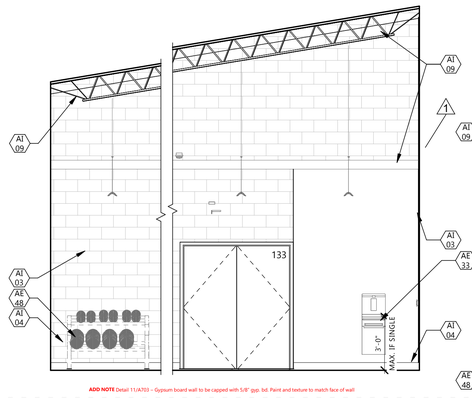
A401



13 A703 FITNESS RM 133 - WEST
1/4" = 1'-0"

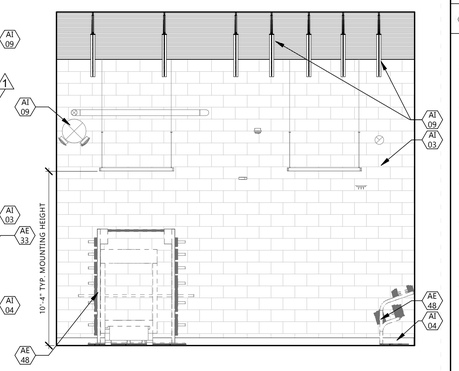


12 A703 FITNESS RM 133 - SOUTH
1/4" = 1'-0"

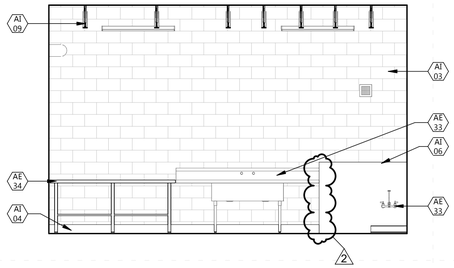


ADD NOTE Detail 11/A703 - Gypsum board wall to be capped with 5/8" gyp. bd. Paint and texture to match face of wall

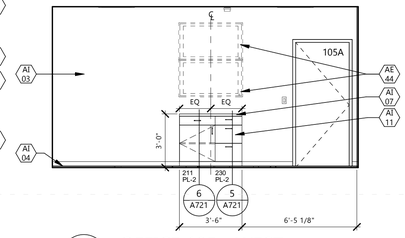
11 A703 FITNESS RM 133 - EAST
1/4" = 1'-0"



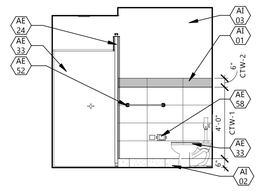
10 A703 FITNESS RM 133 - NORTH
1/4" = 1'-0"



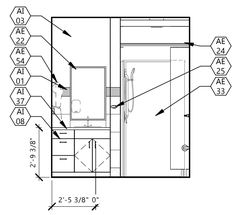
9 A703 HOSE DRYING 130 - SOUTH
1/4" = 1'-0"



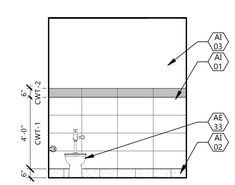
8 A703 OFFICE 105 - WEST
1/4" = 1'-0"



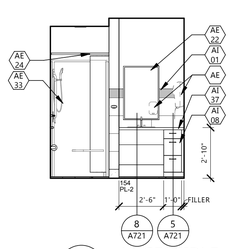
2
16 A703 BATH - TYPICAL
1/4" = 1'-0"



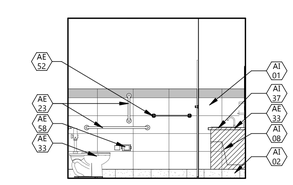
15 A703 BATH - TYPICAL
1/4" = 1'-0"



14 A703 BATH - TYPICAL
1/4" = 1'-0"



7 A703 ACCESSIBLE - BATH
1/4" = 1'-0"



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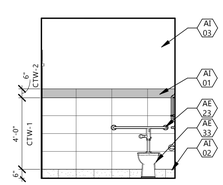
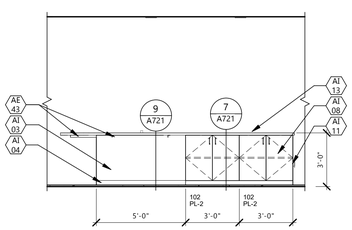
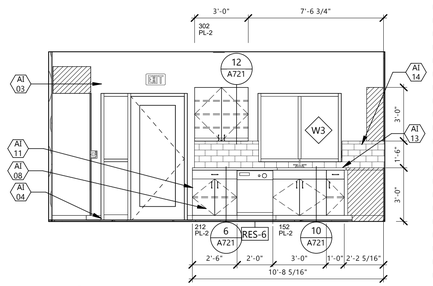
6 A703 ACCESSIBLE - BATH
1/4" = 1'-0"



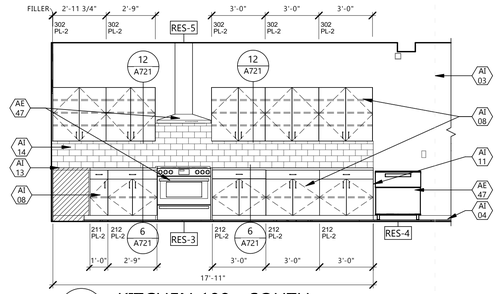
5 A703 ACCESSIBLE - BATH
1/4" = 1'-0"



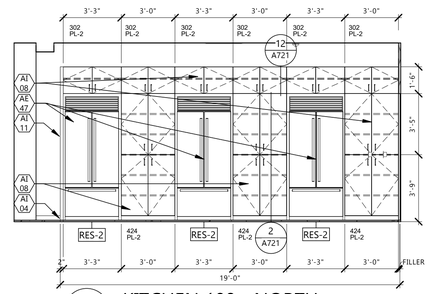
4 A703 KITCHEN 108 ISLAND TYP.
1/4" = 1'-0"



3 A703 KITCHEN 108 - EAST
1/4" = 1'-0"



2 A703 KITCHEN 108 - SOUTH
1/4" = 1'-0"



1 A703 KITCHEN 108 - NORTH
1/4" = 1'-0"

KEYNOTE LEGEND:

< < < INDICATES KEYNOTE ON PLAN

AE	ARCHITECTURAL ELEMENTS
AE 22	FRAMED MIRROR - TA-02, SEE SPECIFICATION 10 2800 AND A001 FOR ADDITIONAL INFORMATION.
AE 23	GRAB BAR - TA-03, SEE SPECIFICATION 10 2800 AND A001 FOR ADDITIONAL INFORMATION.
AE 24	SHOWER CURTAIN AND ROD - TA-04 AND TA-05, SEE SPECIFICATION 10 2800 AND A001 FOR ADDITIONAL INFORMATION.
AE 25	ROBE HOOK - TA-07, SEE SPECIFICATION 10 2800 AND A001 FOR ADDITIONAL INFORMATION.
AE 33	PLUMBING FIXTURE, SEE P201 AND P801 FOR ADDITIONAL INFORMATION.
AE 34	STAINLESS STEEL TABLE, CONTRACTOR FURNISH CONTRACTOR INSTALL, OWNER SELECTION DURING APPLIANCE / FURNITURE ALLOWANCE.
AE 43	CONCEALED METAL COUNTERTOP SUPPORT, IRON SUPPORTS, HIDDEN GRANITE COUNTERTOP L BRACKET - 22", EVERY 36" OF COUNTERTOP.
AE 44	WALL MOUNTED TELEVISION/MONITOR, GC TO PROVIDE WALL BLOCKING WITHIN CAVITY WALL 1/4" PER FOOT, SEE DETAIL 10/A902 FOR ADDITIONAL INFORMATION.
AE 47	RESIDENTIAL APPLIANCE.
AE 48	FITNESS ROOM EQUIPMENT, OWNER PROVIDED BY ALLOWANCE 1, SEE SPEC.
AE 52	TOWEL BAR - TA-06, SEE SPECIFICATION 10 2800 AND A001 FOR ADDITIONAL INFORMATION.
AE 54	SOAP AND PAPER TOWEL DISPENSOR, OFOI.
AE 58	TOILET TISSUE DISPENSOR TA-01, SEE SPECIFCATION 10 2800. TYP ALL TOILETS.
AI 01	CERAMIC TILE WALL - CTW-1 SEE A901 FOR ADDITIONAL INFORMATION.
AI 02	CERAMIC TILE BASE - CBT-1, SEE A901 FOR ADDITIONAL INFORMAIOTN.
AI 03	PAINTED WALL - PNT-1, SEE A901 FOR ADDITIONAL INFORMATION.
AI 04	RESILIENT BASE - RB-1, SEE A901 FOR ADDITIONAL INFORMATION.
AI 06	FIBER REINFORCED PLASTIC PANEL - FRP-1, SEE A901 FOR ADDITIONAL INFORMATION.
AI 07	PLASTIC LAMINATE COUNTERTOP - PL-1, SEE A901 FOR ADDITIONAL INFORMAITON.
AI 08	PLASTIC LAMINATE CASEWORK - PL-2, SEE A901 FOR ADDITIONAL INFORMAITON.
AI 09	PAINTED EXPOSED CEILING AND MECHANICAL DUCTS - PNT-4, SEE A901 FOR ADDITIONAL INFORMATION.
AI 11	PLASTIC LAMINATE CASEWORK - FINISHED END.
AI 13	FABRICATED QUARTZ COUNTERTOP - QTZ-1, SEE A901 FOR ADDITIONAL INFORMATION.
AI 14	CERAMIC WALL TILE - CTW-3, SEE A901 FOR ADDITIONAL INFORMATION.
AI 37	SOLID SURFACE COUNTERTOP - SSF-1, SEE A901 FOR ADDITIONAL INFORMAITON.

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CITY BISMARCK
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PROJECT NO: 20253510
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DRAWING TITLE
INTERIOR ELEVATIONS

A703

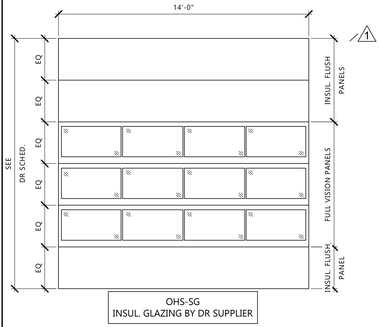
Revit Version: 2025
Plot Date: 11/17/2026 10:59:06 AM

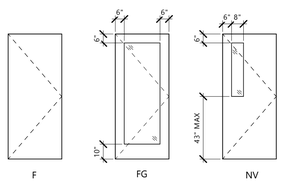
DOOR SCHEDULE

DR #	ROOM NAME	DOOR PANEL(S) OPENING SIZE	MTRL	TYPE	DOOR FRAME MTRL	TYPE	DETAILS - SEE SHEET A801 HEAD	JAMB	SILL	FIRE RATING	HDWE GROUP	NOTES
101	VESTIBULE	3'-0" x 7'-0"	AL	FG	AL	AL3.1	20/A821	21/A821	10/A821		1	2, 3, 4, 5
102	RISER ROOM	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		2	
103	VESTIBULE	3'-0" x 7'-0"	WD	FG	HM	HM-02	1/A821	2/A821	-		3	2, 5
104	HALL	3'-0" x 7'-0"	WD	FG	HM	HM-02	1/A821	2/A821	-		4	
105A	DAYROOM	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		5	
105B	WORK ROOM	3'-0" x 7'-0"	WD	NV	HM	HM-00	1/A821	2/A821	-		5	
106	OFFICE	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-	20 MIN	5	
107	BATH	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		6	
108	KITCHEN	3'-0" x 7'-0"	AL	FG	AL	AL3.3	11/A821	12/A821 & 13/A821	10/A821		1A	3, 4, 5
110	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-	20 MIN	5	
111	SLEEPING 2	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		6	
112	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-	20 MIN	5	
113	SLEEPING 3	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		6	
114	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		4A	
115	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-	20 MIN	5	
116	SLEEPING 4	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		6	
117	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-	20 MIN	5	
118	SLEEPING 5	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		6	
119	HALL	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		2	
120	JANITOR	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821	-		2	
122	DAYROOM	3'-0" x 7'-0"	WD	F	HM	HM-00	1/A821	2/A821			4A	
123A	TURNOUT LOCKERS	3'-0" x 7'-0"	HM	NV	HM	HM-00m	3/A821	4/A821	-	1 HR	7	
123B	TURNOUT LOCKERS	2'-0" x 7'-0"	HM	F	HM	HM-00	3/A821	4/A821	-		2	
124	CORRD.	3'-0" x 7'-0"	HM	F	HM	HM-00m	3/A821	4/A821	-		8	
125A	CORRD.	3'-0" x 7'-0"	HM	NV	HM	HM-00m	3/A821	4/A821	-	1 HR	7	
125B	CORRD.	3'-0" x 7'-0"	HM	NV	HM	HM-00m	3/A821	4/A821	-		4	
126	CORRD.	3'-0" x 7'-0"	HM	F	HM	HM-00m	3/A821	4/A821	-		8	
127	CORRD.	3'-0" x 7'-0"	HM	F	HM	HM-00m	3/A821	4/A821	-		2	
128A	CORRD.	3'-0" x 7'-0"	HM	NV	HM	HM-00m	3/A821	4/A821	-		4A	
128B	TURNOUT LOCKERS	3'-0" x 7'-0"	HM	NV	HM	HM-00m	3/A821	4/A821	-		4A	
128C	APPARATUS BAY	3'-0" x 7'-0"	HM	NV	INSUL-HM	HM-00	7/A821	5/A821	6/A821		3A	4, 5
128D	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 7
128E	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 7
128F	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 7
128G	APPARATUS BAY	3'-0" x 7'-0"	INSUL-HM	NV	INSUL-HM	HM-00	7/A821	5/A821	6/A821		3A	4, 5
128H	APPARATUS BAY	3'-0" x 7'-0"	INSUL-HM	NV	INSUL-HM	HM-00	8/A821	5/A821 & 9/A821	6/A821		3A	4, 5
128I	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 8
128J	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 8
128K	APPARATUS BAY	14'-0" x 14'-0"		OHS-SG	INSUL STL/AL	OHS	15/A821	16/A821	14/A821			4, 8
128L	APPARATUS BAY	3'-0" x 7'-0"	INSUL-HM	NV	INSUL-HM	HM-00	8/A821	5/A821 & 9/A821	6/A821		3A	4, 5
132	MECH	3'-0" x 7'-0"	HM	F	HM	HM-00					2	
133	APPARATUS BAY	6'-0" x 7'-0"	HM	F	HM	HM-00	3/A821	4/A821	-		9	1
134A	APPARATUS BAY	3'-0" x 7'-0"	HM	F	HM	HM-00	3/A821	4/A821	-		2	
134B	MAINTENANCE ROOM	8'-0" x 8'-0"	INSUL-HM	F	INSUL. STL	OHS						8
135	ELEC. ROOM	3'-0" x 7'-0"	HM	F	HM	HM-00					2	
201	TRAINING/ STOR.	3'-0" x 7'-0"	HM	F	HM	HM-00m	3/A821	4/A821	-		2	
202	DATA	3'-0" x 7'-0"	HM	F	HM	HM-00	3/A821	4/A821	-		2	

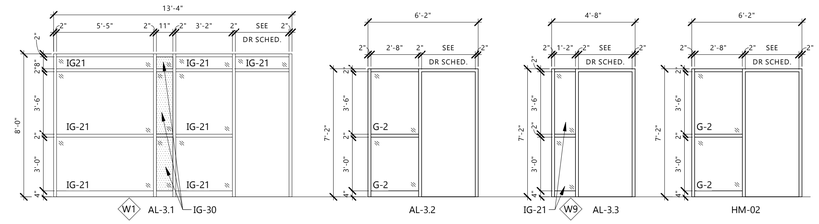
DOOR NOTES

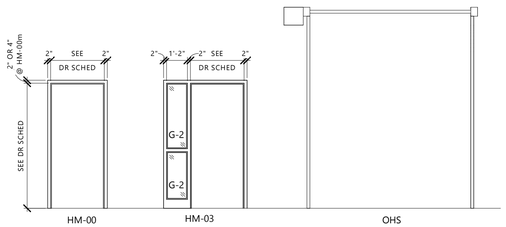
1. DOUBLE DOOR
2. AUTOMATIC DOOR OPERATOR
3. THERMALLY-BROKEN ASSEMBLY WITH INSULATED GLASS
4. INSULATED GLASS AND HARDWARE BY DOOR MANUFACTURE
5. CARD READER
6. SPANDREL GLAZING
7. HIGH PERFORMANCE ELECTRIC OPERATOR.
8. STANDARD PERFORMANCE ELECTRIC OPERATOR.



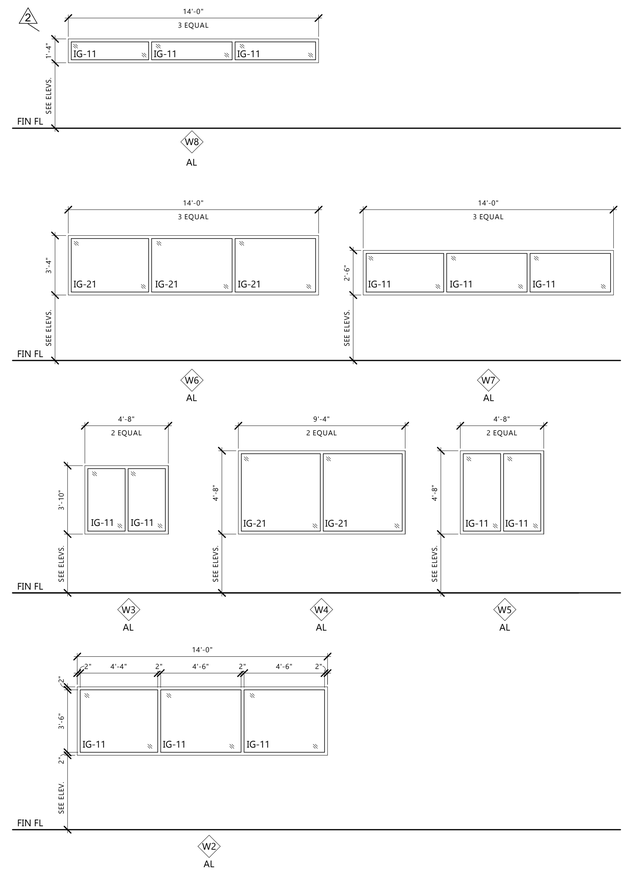


X A801 DOOR PANEL TYPES
1/4" = 1'-0"

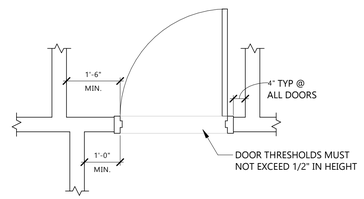




X A801 DOOR FRAME TYPES
1/4" = 1'-0"



X A801 WINDOW TYPES
1/4" = 1'-0"



1 A801 ADA DOOR CLEARANCES
1/2" = 1'-0"

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CONSULTANTS

CLIENT
BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARCK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
3	ADDENDUM #3	11/17/2026
2	ADDENDUM #2	11/13/2026
1	ADDENDUM #1	11/05/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2026

PROJECT NO: 20253510
DRAWN BY: AS, MS
CHECKED BY: BD

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Architect under the laws of the State of North Dakota.
Signature:
Date: 10/29/2026 REG. NO. : 1718

DRAWING TITLE
DOOR SCHEDULE, DOOR AND WINDOW ELEVATIONS

A801

Revit Version: 2025
Plot Date: 11/17/2026 10:09:07 AM

DOMESTIC WATER BALANCING VALVE SCHEDULE

ITEM NUMBER	MANUFACTURER	MODEL #	SERVICE	CONNECTION SIZE	INLET TEMP	OUTLET TEMP	NOTES:
CS-1	CIRCUIT SOLVER	CS-3/4-110	DOMESTIC WATER	3/4"	120°F	110°F	1, 2
CS-2	CIRCUIT SOLVER	CS-1/2-110	DOMESTIC WATER	1/2"	120°F	110°F	1, 2

1. ANSI-61 RATED
2. PROVIDE SUITABLE LINE SIZE ISOLATION VALVES, UNIONS AND STRAINER AS INDICATED BY MANUFACTURERS REQUIREMENTS & PER DETAIL ON DRAWINGS.

PLUMBING PUMP SCHEDULE

NUMBER	SERVICE	MFGR.	MODEL	PUMP TYPE	GPM	TOTAL HEAD	MOTOR CHARACTERISTICS			NOTES:
							RPM	HP	V / PH	
RCP-1	DOMESTIC WATER CIRCULATOR	BELL & GOSSETT	NBF-36	INLINE	2	9	2,950	1/15	120 / 1	1, 2, 3, 4

1. ITT BELL & GOSSET 100% LEAD-FREE BRONZE PUMP.
2. INSTALL WITH ISOLATION VALVES & UNIONS AS REQUIRED FOR PUMP MAINTENANCE.
3. PROVIDE AQUASTAT AND TIMER.
4. PUMP SHALL BE SUITABLE FOR DOMESTIC POTABLE HOT WATER AND SHALL BE PROVIDED WITH A DISCONNECT SWITCH.

WATER HEATER SCHEDULE

TAG	MANUFACTURER	SERIES	MODEL #	TANK	LOCATION	FUEL	INPUT BTU	RECOVERY @ 90°F RISE	STORAGE CAPACITY	WATER TEMP	V / PH	NOTES:
WH-1	BRADFORD WHITE	TTW	RG2PV75H6N	75	MECHANICAL ROOM	NATURAL GAS	75,000	82	72	140	120 / 1	1,2,3,4
WH-2	BRADFORD WHITE	TTW	RG2PV75H6N	75	MECHANICAL ROOM	NATURAL GAS	75,000	82	72	140	120 / 1	1,2,3,4

1. ASME RATED
2. PIPE RELIEF VALVES OVER FLOOR DRAIN
3. PROVIDE UNIT COMPLETE WITH CONCENTRIC VENT KIT AND INSTALL AS PER MANUFACTURERS INSTRUCTIONS.
4. ALL VENTING SHALL BY POLYPROPYLENE MATERIAL OR APPROVED EQUAL.

NOTE: PROVIDE A BELL & GOSSETT MODEL PTA-12 EXPANSION TANK WITH 5 GALLON TANK VOLUME AND 3.3 GALLON ACCEPTANCE VOLUME FOR DOMESTIC WATER HEATING SYSTEM DET-1.

PLUMBING FIXTURE SCHEDULE

ITEM NO.	MANUFACTURER	MODEL NO.	DESCRIPTION	FLOW RATE	CONNECTIONS - INCHES				REMARKS
					WASTE	VENT	CW	HW	
CO-1	ZURN	Z1400	CAST IRON BODY, ADJUSTABLE COLLAR, NICKEL BRONZE TOP, ABS TAPERED PLUG		VARIES				SEE PLANS FOR PIPE SIZES
EWC-1	ELKAY	EZSG8WSSK	BOTTLE FILLING STATION & SINGLE ADA COOLER, HIGH EFFICIENCY NON FILTERED REFRIGERATED STAINLESS STEEL, BOTTLE FILLER SENSOR 8 GALLON CHILLING CAPACITY,		2"	2"	1/2"		INSTALL WITH WALL CARRIER
FD-1	ZURN	Z415B	CAST IRON BODY, ADJUSTABLE COLLAR, NICKEL BRONZE ROUND STRAINER		VARIES	VARIES			PROVIDE DEEP SEAL P-TRAP 'SEE PLANS FOR PIPE SIZES
FD-2	ZURN	Z415S	CAST IRON BODY, ADJUSTABLE COLLAR, NICKEL BRONZE SQUARE STRAINER		VARIES	VARIES			PROVIDE DEEP SEAL P-TRAP 'SEE PLANS FOR PIPE SIZES
FS-1	ZURN	Z1900	12"X12"X6" DEEP CAST IRON BODY & SQUARE, LIGHT DUTY GRATE WITH 1/2" SLOTTED OPENINGS WHITE ACID RESISTING PORCELAIN ENAMEL INTERIOR AND TOP, 1/2 GRATE		2"	2"			
HB-1	CHICAGO FAUCETS	998-12RCF	INSIDE SILL FITTING, VANDAL PROOF 2 1/4" TEE HANDLE SLOW COMPRESSION OPERATING CARTRIDGE, VACUUM BREAKER ASSEMBLY				3/4"		
HYD-1	ZURN	Z1321	ANTI SIPHON, AUTOMATIC DRAINING WALL HYDRANT, NON FREEZE INTEGRAL BACKFLOW PREVENTER, OPERATING KEY LOCK				3/4"		
L-1	AMERICAN STANDARD	0491.019	COUNTERTOP SINK, MADE FROM VITREOUS CHINA, FRONT OVERFLOW FAUCET HOLES 4" ON CENTERS, FAUCET LEDGE		2"	2"			
	ZURN	Z81000-XL-2M	POLISHED CHROME PLATED CAST BRASS 4" CENTERSET SINGLE HANDLE FAUCET CERAMIC DISC CARTRIDGE, TEMPERATURE LIMIT STOP	2.2 GPM			1/2"	1/2"	
L-2	AMERICAN STANDARD	0355.012	WALL-HUNG SINK, VITREOUS CHINA, FRONT OVERFLOW, D-SHAPED BOWL SELF-DRAINING DECK AREA W/ CONTOURED BACK & SIDE SPLASH SHIELDS		2"	2"			INSTALL WITH CARRIER
	ZURN	Z81000-XL-2M	POLISHED CHROME PLATED CAST BRASS 4" CENTERSET SINGLE HANDLE FAUCET	2.2 GPM			1/2"	1/2"	
MB-1	MUSTEE	63M	MOLDED FROM HIGH IMPACT RESISTANT DURASTONE STRUCURAL FIBERGLASS 24"x24" INTEGRAL, MOLDED IN DRAIN		3"	2"			
	ZURN	Z843M1	POLISHED CHROME-PLATED CAST BRASS FAUCET BODY W/ INTEGRAL SHANKS 1/4" TURN CERAMIC DISC CARTRIDGES & 8" CAST BRASS SWING SPOUT				3/4"	3/4"	
MB-2	MUSTEE	65M	MOLDED FROM HIGH IMPACT RESISTANT DURASTONE STRUCURAL FIBERGLASS 24"X36" INTEGRAL, MOLDED-IN DRAIN, ELEVATED SELF DRAINING SHELF		3"	2"			
	ZURN	Z843M1	POLISHED CHROME-PLATED CAST BRASS 8" SINK FAUCET 1/4" TURN CERAMIC DISC CARTRIDGES, 6" BRASS SPOUT W/ VACUUM BREAKER				3/4"	3/4"	
MV-1	LAWLER	NEPTUNE EMX 100 MS	ASSE 1017 ELECTRONIC MIXING VALVE, STAINLESS STEEL CONSTRUCTION MAX OPERATING PRESSURE 150 PSI, PROGRAMMABLE HIGH TEMP ALARM CONTROL BOX SUPPLIED WITH 4' 120 VAC POWER CORD				1 1/4"	1 1/4"	
S-1	ELKAY	DLR332210PD	LUSTERONE STAINLESS STEEL 33"X22"X10 1/8", EQUAL DOUBLE BOWL CENTER DRAIN LOCATION, 18 GAUGE, PERFECT DRAIN, 3 HOLES		2"	2"			
	ZURN	Z824B0-XL-HS	POLISHED CHROME-PLATED CAST BRASS SINGLE CONTROL FAUCET RIGID OR SWING SPOUT, CERAMIC DISC CARTRIDGE, HAND SPRAY	2.2 GPM			1/2"	1/2"	
	INSINKERATOR	BADGER 5	CONTINUOUS FEED, ANTI VIBRATION, DISHWASHER CONNECTION						3/4 HP, 120/1, 8.1 AMPS, CORD WITH PLUG, 1725 RPM
S-2	JOHN BOOS	2B244-2D24	16 GAUGE STAINLESS STEEL, TYPE 300 STAINLESS STEEL, SATIN FINISH 14" DEEP BOWLS, FULL LENGTH 10" HIGH BOXED BACKSPLASH		2"	2"			
	T&S	S-0133-A12-B	8" STAINLESS STEEL WALL MOUNT MIXING FAUCET, 44" FLEXIBLE HOSE 1/4 TURN ETERNA CARTRIDGES W/ SPRING CHECKS, LEVER HANDLES				1/2"	1/2"	
SH-1	AQUATIC	1423CT	42"X42"X76" SHOWER STALL, SMOOTH WALL FINISH MOLDED TOILETRY SHELVES, CENTER DRAIN, WHITE		2"	2"			
	ZURN	Z7101-SS-LH	PRESSURE BALANCING MIXING SHOWER VALVE, SINGLE BRONZE STEM STAINLESS STEEL BALANCING PISTON INTEGRAL W/ STEM ASSEMBLY	2.5 GPM			1/2"	1/2"	
SH-2	AQUATIC	1363BFSD	36"X36"X75 1/4" SHOWER SURROUND WITH 1/2" BEVELED THRESHOLD CENTER DRAIN LOCATION, SLIP RESISTANT TEXTURED BOTTOM		2"	2"			ENSURE 2" RECESS OF FLOOR FOR SHOWER BASE FULLY EQUIPPED WITH SEAT-ADA, VERIFY SEAT LOCATION WITH ARCH
	ZURN	Z7101-SS-LH-DV2P-HW	PRESSURE BALANCING MIXING SHOWER VALVE, SINGLE BRONZE STEM 60" FLEXIBLE METAL HOSE, 24" MOUNTING SLIDE BAR WALL CONNECTIONS	2.5 GPM			1/2"	1/2"	
SH-3	ZURN	Z7101-SS-LH-DV2P-HW	PRESSURE BALANCING MIXING SHOWER VALVE, SINGLE BRONZE STEM 60" FLEXIBLE METAL HOSE, 24" MOUNTING SLIDE BAR WALL CONNECTIONS	2.5 GPM			1/2"	1/2"	
	MOHLER	K-32328	9 KW STEAM GENERATOR, CONSTRUCTED OR INSULATED STAINLESS STEEL						INSTALL CONTROL PANEL ON THE SAME WALL AS SHOWER CONTROLS
	KOHLER	K-5559	SMALL DRAIN PAN						
	KOHLER	K-5557	POLISHED CHROME STEAM GENERATOR CONTROL KIT						INSTALL PENTEK WS-20BB FILTER AND 150233 PENTAIR HOUSING
SOI-1	STRIEM	OS-500	100 GPM POLYETHYLENE HIGH EFFICIENCY OIL/WATER SEPARATOR LIQUID CAPACITY 500 GALLONS, OIL CAPACITY 125 GALLONS SOLIDS CAPACITY 164 GALLONS, H20 TRAFFIC RATED CAST IRON COVERS		4"	3"			
TD-1	ACO	POWERDRAIN	S300K SERIES TRENCH DRAIN, CLASS F SLOTTED IRON HEAVY DUTY GRATE DURABLE BLACK FINISH, TRENCH SHALL BE 12" WIDE		4"				20" LENGTH
U-1	AMERICAN STANDARD	6590.001EC	VITREOUS CHINA WALL HUNG URINAL, FLUSHING RIM ELONGATED 14" RIM FROM FINISHED WALL, WASHOUT FLUSH ACTION		2"	2"			INSTALL WITH CARRIER
	ZURN	ZER6003AV-CPM	EXPOSED SENSOR URINAL FLUSHOMETER, POLISHED CHROME FINISH QUIET DIAPHRAGM TYPE, DUAL SEAL DIAPHRAGM	1.0 GPF			3/4"		
WB-1	OATEY	39141	METAL ICE MAKER BOX, 20 GAUGE STEEL, METAL 1/4 TURN VALVE 28 GAUGE FACEPLATE				1/2"		
WC-1	AMERICAN STANDARD	3461.001	FLOOR MOUNT FLUSHOMETER VALVE TOILET, VITREOUS CHINA FULLY GLAZED 2 1/8" TRAPWAY, ELONGATED BOWL,		4"	2"			ADA COMPLIANT
	ZURN	Z6000AV	EXPOSED, QUIET DIAPHRAGM TYPE, CHROME PLATED FLUSHOMETER VALVE DUAL SEAL DIAPHRAGM, CHLORAMINE RESISTANT	1.6 GPM			1"		
	BEMIS	1955SSCT	ELONGATED, OPEN DRONT LESS COVER, SELF SUSTAINING CHECK HINGES						
WT-1	OATEY	38540	WASHING MACHINE SUPPLY/DRAIN BOX QUARTER TURN BALL VALVES HAMMER ARRESTORS		2"	2"	3/4"	3/4"	

NOTES:

1. PROVIDE COLD WATER AND HOT WATER SCREWDRIVER STOPS AT ALL SINKS, LAVATORIES, ELECTRIC WATER COOLERS, ETC.
2. ALL WATER SUPPLIES AND STOPS SHALL BE INSTALLED SECURE TO BACKING IN WALL OR SUPPLY STRAPS AS REQUIRED FOR A SECURE, RIGID INSTALLATION.
3. PROVIDE ESCUTCHEONS AT ALL WASTE AND WATER SUPPLIES AT EACH FIXTURE. ESCUTCHEONS SHALL COMPLETELY COVER WALL OPENING.
4. ALL WALL HUNG WATER CLOSETS, URINALS AND LAVATORIES SHALL BE CAULKED/SEALED ALL AROUND INCLUDING THE UNDERSIDE. FLOOR MOUNTED WATER CLOSETS SHALL NOT BE CAULKED/SEALED TO FLOOR.
5. ALL COUNTER MOUNTED FIXTURES SHALL BE CAULKED/SEALED AS PER THE MANUFACTURERS INSTRUCTIONS.
6. COORDINATE ALL SELF RIMMING LAVATORIES AND SINKS WITH GENERAL CONTRACTOR AND CASEWORK SUPPLIER FOR FIT.
7. ALL A.D.A. COMPLIANT WATER CLOSETS SHALL HAVE FLUSHING MECHANISM TO OPEN SIDE OF ROOM OR STALL.
8. ALL EXPOSED P-TRAPS AND WATER SUPPLIES AT A.D.A. ACCESSIBLE LOCATIONS SHALL BE PROVIDED WITH PROTECTIVE SHIELD OR COVERS AS SPECIFIED.

LEGEND

WC = WATER CLOSET	EWS = EYEWASH STATION
U = URINAL	HYD = HYDRANT
L = LAVATORY	HB = HOSE BIB
S = SINK	TD = TRENCH DRAIN
B = BATHTUB	FS = FLOOR SINK
SH = SHOWER	FD = FLOOR DRAIN
MB = MOP BASIN	CO = CLEANOUT
LT = LAUNDRY TUB	WCO = WALL CLEANOUT
EWC = ELEC. WATER COOLER	RD = ROOF DRAIN
WT = WASHER TRIM	ORD = OVERFLOW ROOF DRAIN
BF = BOTTLE FILLER	TD = TRENCH DRAIN
WB = WATER OUTLET BOX	SOI = SAND OIL INTERCEPTOR
CB = CATCH BASIN	GI = GREASE INTERCEPTOR
MV = MIXING VALVE	

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CLIENT
BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARCK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
1	ADDENDUM #3	11/17/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2026

PROJECT NO: 20253510
DRAWN BY: CL
CHECKED BY: JL

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REGISTERED PROFESSIONAL ENGINEER
TYLER COULOMBE
PE-7492
DATE 11/17/2026
NORTH DAKOTA

DRAWING TITLE
PLUMBING SCHEDULES

P801

GENERAL NOTES

A. LIGHTING ALL JUNCTION BOXES ABOVE ACCESSIBLE CEILING WITH INDELIBLE INK TO INICATE PANEL AND CIRCUIT.

B. LABEL ALL HOME RUNS WITH INDELIBLE INK TO INDICATE PANEL AND CIRCUIT.

C. PROVIDE APPROVED FIRE PROOFING MATERIALS / METHODS FOR CABLE PASSING THROUGH FIRE WALLS AND FLOORS.

D. LABEL ALL DEVICES INCLUDING SWITCHES, TO INDICATE PANEL AND CIRCUIT. USE ADHESIVE MYLAR TYPE.

E. PROVIDE #10 CONDUCTORS THROUGHOUT ALL 120V, 20A BRANCH CIRCUIT OF 100'-0" OR GREATER IN LENGTH.

F. PROVIDE ALL DEVICES AND ASSOCIATED WIRING AS SHOWN.

G. EMERGENCY POWER CIRCUITS SHALL BE RUN IN A SEPARATE CONDUIT FROM NORMAL POWER CIRCUITS. EMERGENCY POWER CIRCUITS SHALL NOT SHARE CONDUIT WITH NORMAL POWER CIRCUITS.

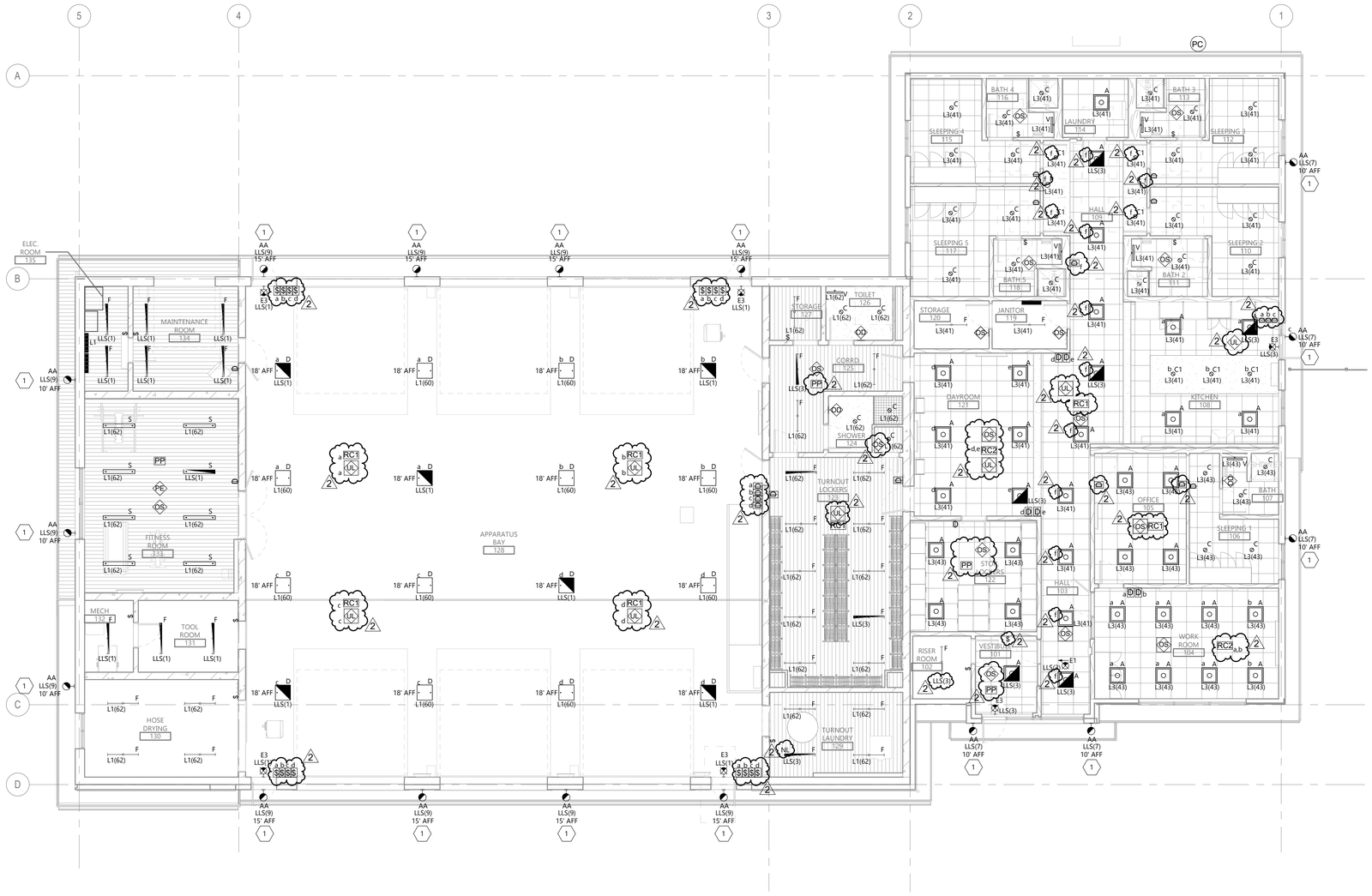
H. MC CABLE SHALL BE USED IN WALLS FOR SINGLE CIRCUIT RUNS AND SWITCH LEGS. SWITCH LEGS SHALL CONTAIN ONE EXTRA CONDUCTOR. MC CABLE MAY NOT BE USED ABOVE CEILING IN ANY INSTANCE, AND MAY NOT BE USED IN WALLS OF ROOMS THAT DO NOT HAVE ACCESSIBLE CEILING. DO NOT USE THROUGH SMOKE / FIRE WALLS.

I. OCCUPANCY SENSORS ARE SHOWN FOR INTENT PURPOSES ONLY. LOCATION, SPACING, AND QUANTITY WILL DEPEND ON SELECTED MANUFACTURER.

KEYNOTE LEGEND:

⬡ < < < INDICATES KEYNOTE ON PLAN

1. ROUTE LIGHTING CIRCUITRY THROUGH LIGHTING CONTROL RELAY. SEE 3/E100



1 E301 FIRST FLOOR LIGHTING PLAN

1/8" = 1'-0"

Revit Version: 2025
Plot Date: 11/17/2026 11:02:07 AM

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116 W. Main Ave., Suite A, Bismarck ND 58501
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CONSULTANTS

CLIENT
BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
2	ADDENDUM 3	11/17/2026
1	ADDENDUM 2	11/13/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2025

PROJECT NO: 20253510
DRAWN BY: TA
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BRIAN WENTLAND
PE-27191
DATE 11/17/2026
NORTH DAKOTA

DRAWING TITLE
FIRST FLOOR LIGHTING PLAN

E301

GENERAL NOTES

A. LABEL ALL JUNCTION BOXES ABOVE ACCESSIBLE CEILING WITH INDELIBLE INK TO INICATE PANEL AND CIRCUIT.

B. LABEL ALL HOME RUNS WITH INDELIBLE INK TO INDICATE PANEL AND CIRCUIT.

C. PROVIDE APPROVED FIRE PROOFING MATERIALS / METHODS FOR CABLE PASSING THROUGH FIRE WALLS AND FLOORS.

D. LABEL ALL DEVICES INCLUDING SWITCHES, TO INDICATE PANEL AND CIRCUIT. USE ADHESIVE MYLAR TYPE.

E. PROVIDE #10 CONDUCTORS THROUGHOUT ALL 120V, 20A BRANCH CIRCUIT OF 100'-0" OR GREATER IN LENGTH.

F. PROVIDE ALL DEVICES AND ASSOCIATED WIRING AS SHOWN.

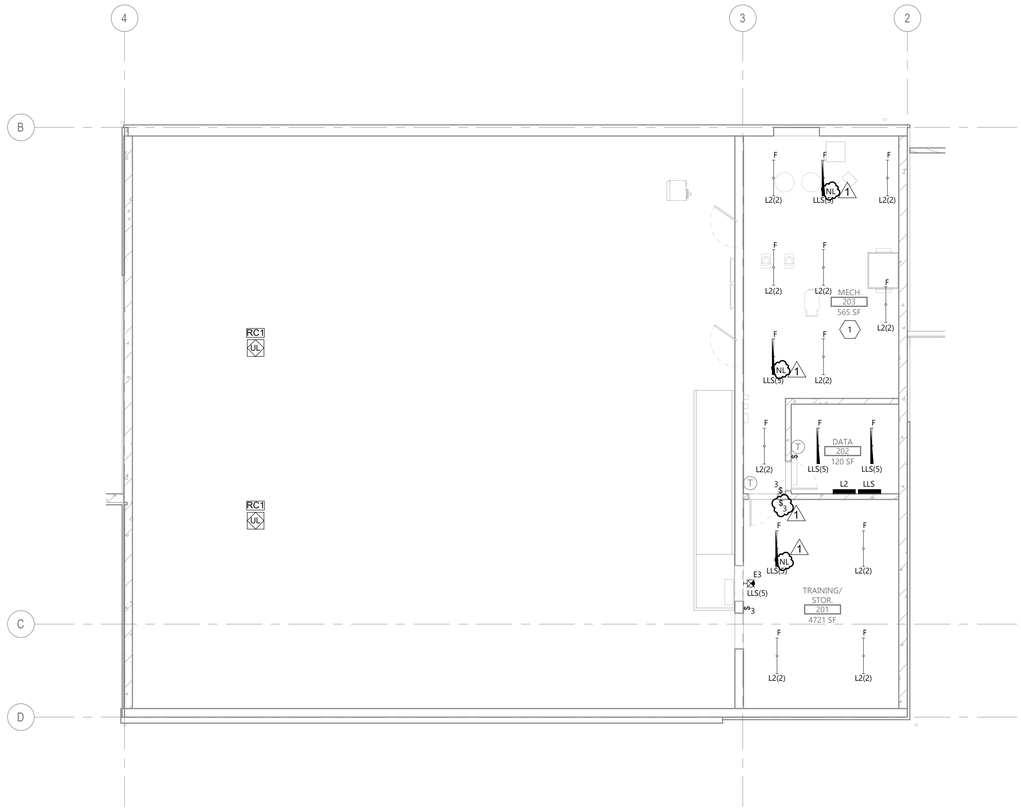
G. EMERGENCY POWER CIRCUITS SHALL BE RUN IN A SEPARATE CONDUIT FROM NORMAL POWER CIRCUITS. EMERGENCY POWER CIRCUITS SHALL NOT SHARE CONDUIT WITH NORMAL POWER CIRCUITS.

H. MC CABLE SHALL BE USED IN WALLS FOR SINGLE CIRCUIT RUNS AND SWITCH LEGS. SWITCH LEGS SHALL CONTAIN ONE EXTRA CONDUCTOR. MC CABLE MAY NOT BE USED ABOVE CEILING IN ANY INSTANCE, AND MAY NOT BE USED IN WALLS OF ROOMS THAT DO NOT HAVE ACCESSIBLE CEILING. DO NOT USE THROUGH SMOKE / FIRE WALLS..

KEYNOTE LEGEND:

< < < INDICATES KEYNOTE ON PLAN

1. COORDINATE EXACT LUMINAIRE LOCATION WITH MECHANICAL EQUIPMENT THIS ROOM PRIOR TO ROUGH-IN.



1 E302 SECOND FLOOR LIGHTING PLAN

1/8" = 1'-0"

N

Revit Version: 2025
Plot Date: 11/7/2026 11:02:07 AM

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PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
1	ADDENDUM 3	11/17/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2025

PROJECT NO: 20253510
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PE-27191
DATE 11/17/2026
NORTH DAKOTA

DRAWING TITLE
SECOND FLOOR LIGHTING PLAN

E302

LIGHTING CONTROL SCHEDULE

SYMBOL	MANUFACTURER	CATALOG NAME	MOUNTING			VOLTAGE		TYPE			NOTES	DESCRIPTION
			WALL	CLING	ABV. CLG	LINE	LOW	OCCUPANCY	VACANCY	OTHER		
RC#	NLIGHT	NPP16 D			X	X				X	1	DIGITAL DIMMER ROOM CONTROLLER, # INDICATES NUMBER OF RELAYS (CAT6)
OS	SENSOR SWITCH	CM PDT 9/10 R D		X			X	X			5	CEILING MOUNTED SENSOR, DUAL TECHNOLOGY, SMALL OR LARGE MOTION TO BE DETERMINED BY MANUFACTURER, LOW VOLTAGE RELAY, DIMMING OPTION
PE	IOTA	ETS -20			x	x				x		DEVICE SHALL TURN EMERGENCY LIGHTS ON TO 100% OUTPUT UPON LOSS OF POWER.
OD	SENSOR SWITCH	WSX PDT D	X			X		X				WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL 0-10V DIMMING WITH ON/OFF BUTTON
OS	SENSOR SWITCH	WSX PDT	X			X		X				WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH ON/OFF SWITCH
D	NLIGHT	NPODMA DX	X				X					DIMMER SWITCH SHALL BE MINIMUM ON/OFF BUTTON WITH SEPERATE BUTTONS FOR DIMMING UP AND DIMMING DOWN UNLESS NOTED OTHERWISE ON DRAWINGS. CAT 6 CONNECTION BETWEEN DEVICE AND POWER PACK
#	NLIGHT	NPODMA	X				X					WALL MOUNTED MULTI-BUTTON SWITCH, # TO INDICATE NUMBER OF BUTTONS (CAT6)
OS	NLIGHT	NCM PDT		X			X	X				CEILING MOUNTED DIGITAL DUAL TECHNOLOGY OCCUPANCY SENSOR (CAT6)
PP	SENSOR SWITCH	PP 20			X							NON-DIMMING POWER PACK
ϕ	LUTRON OR EQUAL	DIVA	X								4	120/277V 20A ROCKER SWITCH WITH 0-10V DIMMING. MULTI-WAY SWITCHING TO BE DETERMINED BY THE ELECTRICAL CONTRACTOR FOR SPACE REQUIREMENTS.
$	LUTRON OR EQUAL	20A TOGGLE SWITCH	X								3	120/277V 20A TOGGLE SWITCH. MULTI-WAY SWITCHING TO BE DETERMINED BY THE ELECTRICAL CONTRACTOR FOR SPACE REQUIREMENTS.

GENERAL NOTES:

A. ALL SENSORS ARE SHOWN FOR CONTROL PURPOSE ONLY; ADDITIONAL DEVICE/POWER MAY BE REQUIRED FOR A COMPLEX SYSTEM. VERIFY REQUIRED DEVICES WITH SYSTEM PROVIDER AND INSTALL COMPLETE SYSTEM.
B. WIRE LIGHTING CONTROL COMPONENTS PER MANUFACTURERS INSTRUCTIONS.
C. APPROVED MANUFACTURERS: WATTSTOPPER, CRESTRON, ACUITY BRANDS.
D. SEE SPECICICATION SECTION 262726 OR ON DRAWINGS SPECIFICATIONS FOR FACEPLATE AND DEVICE COLOR.

NOTES:

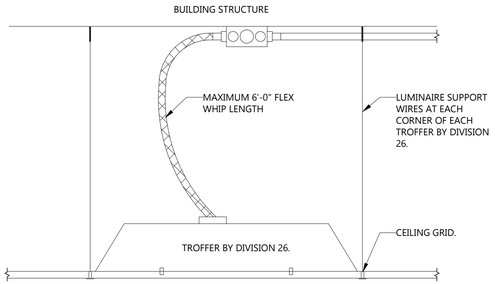
1. NUMBER REPRESENTS QUANTITY OF RELAYS PER DEVICE. SEE LIGHTING SHEETS FOR NUMBER OF RELAYS AND CONTROL ZONES. MULTI-RELAY ROOM CONTROLLERS MAY BE USED IN LIEU OF SINGLE RELAY ROOM CONTROLLERS.
2. SEE SWITCH DETAILS FOR MORE INFORMATION ON SPECIFIC TIMECLOCK SWITCHES/DIMMERS BUTTON LAYOUT AND ENGRAVING.
3. FOR USE AT BACK OF HOUSE, UNFINISHED SPACES, AND 120V 20A MOTOR DISCONNECTS SHALL BE STANDARD TOGGLE SWITCHES. SEE SPECIFICATION SECTION 262726 OR ON DRAWINGS SPECICICATION FOR ADDITIONAL INFORMATION.
4. A LINE VOLTAGE DIMMER SHALL ONLY BE USED IN RESIDENTAL INSTALLATIONS OR WHERE THE LUMINAIRE SUPPORTS ONLY LINE VOLTAGE DIMMING.
5. MANUFACTURER SHALL DETERMINE IF SENSOR SHALL COME WITH INTEGRAL PHOTOCELL IN LIEU OF STAND ALONG DEVICE AS NEEDED FOR DEVICE.

LUMINAIRE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	LAMP	MOUNTING	LOCATION	VOLTAGE	CCT	LUMENS	WATTS	NOTES	DESCRIPTION
A	LITHONIA	2BLT2 40L ADSM EZ1 LP840	LED	RECESSED	ACT	MVOLT	4000	4000	31 W		2X2 TROFFER
C	LITHONIA	EVO6 40/20 AR LSS WD MVOLT GZ1	LED	RECESSED	ACT	MVOLT	4000	2000	20 W		6" LED CAN LIGHT WET LOCATION
C1	LITHONIA	EVO6 40/10 AR LSS MWD MVOLT GZ1	LED	RECESSED	ACT	MVOLT	4000	1000	10 W		6" LED CAN LIGHT WET LOCATION
D	LITHONIA	CPHB ALO16 SWW9 80CRI	LED	CEILING	CEILING	MVOLT	4000	24000	159 W		LED HIGH BAY LIGHT
E1	LITHONIA	LE S 1 R EL N SD	LED	SURFACE	WALL	MVOLT	-	-	1		SINGLE FACED CEILING MOUNTED EMERGENCY EXIT SIGN
E2	LITHONIA	LE S 2 R EL N SD	LED	SURFACE	CEILING	MVOLT	-	-	1		DOUBLE FACED CEILING MOUNTED EMERGENCY EXIT SIGN
E3	LITHONIA	LE S 1 R EL N SD	LED	SURFACE	CEILING	MVOLT	-	-	1		SINGLE FACED WALL MOUNTED EMERGENCY EXIT SIGN
F	LITHONIA	CLX L48 3000LM SSEF L/LENS MVOLT	LED	SURFACE	CEILING	MVOLT	4000	3000	30 W		4' LED STRIP LIGHT
S	MARK ARCHITECTURAL LIGHTING	SPID 4FT 80RI 40K 1000LMF I400LMF	LED	PENDANT	CEILING	MVOLT	4000	1000LM/FT	42 W		PENDANT MOUNTED LINEAR LIGHT
V	LITHONIA	FMVCALS 24IN MVOLT 40K 90CRI BN	LED	SURFACE	WALL	MVOLT	4000	1700	18 W		24" VANITY LIGHT
AA	LITHONIA	WDGE2 LED P2 50K 80CRI T4M	LED	SURFACE	SITE	MVOLT	5000	2000	19 W		EXTERIOR WALL MOUNTED WEDGE LIGHT 2.
BB	LITHONIA	DSX0 LED P3 50K 70CRI T4M	LED	POLE	SITE	MVOLT	5000	9100	69 W		EXTERIOR POLE MOUNTED SITE LIGHT MOUNTED ON STEEL POLE, SEE DRAWINGS FOR MOUNTING HEIGHTS
CC	HYDREL	SAF7 P1 50K KM CSM48	LED	PEDASTEL	SITE	MVOLT	5000	3000	33 W		EXTERIOR PEDASTEL MOUNTED FLOOD LIGHT. PROVIDE 2' STANCHION MOUNT CSM48 AND THREADED KNUCKLE, PROVIDE CYLINDRICAL CONCRETE BASE INGROUND, PROVIDE (2) PVC CONDUITS 2.
DD	HOLOPHANE	WAE3 P50 50K GL3 BD	LED	POLE	SITE	MVOLT	5000	13585	95 W		EXTERIOR POLE MOUNTED SITE LIGHT MOUNTED ON STEEL POLE, SEE DRAWINGS FOR MOUNTING HEIGHTS

NOTES:

1.
2.
3.

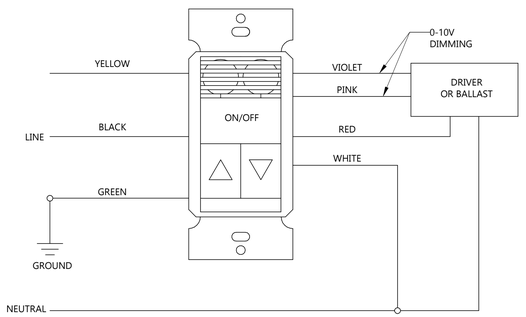


NOTE:

1. DO NOT LOOP FLEX WHIPS FIXTURE-TO- FIXTURE. PROVIDE JUNCTION BOX AS SHOWN.
2. FLEX WHIP SHALL NOT REST ON CEILING GRID. PROVIDE ADDITIONAL SUPPORTS AS NEEDED.

2 / E803 TROFFER INSTALLATION DETAIL

NOT TO SCALE



NOTE: REQUIRES CLASS 1 WIRING FOR 0-10V DIMMING

1 / E803 DUAL TECH SENSOR SWITCH OD WIRING DETAIL

NOT TO SCALE

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CONSULTANTS

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BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARK
STATE ND

ISSUE DATES

2	ADDENDUM 3	11/17/2026
1	ADDENDUM 2	11/13/2026
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MARK	DESCRIPTION	DATE

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PE-27191
DATE 11/17/2026
NORTH DAKOTA

DRAWING TITLE
LIGHTING SCHEDULES & DETAILS

E803

Revit Version: 2025
Plot Date: 11/17/2026 11:02:08 AM

TOTAL LOAD SUMMARY

PANEL NAME	APPARENT POWER PHASE A	APPARENT POWER PHASE B	APPARENT POWER PHASE C	TOTAL CONNECTED CURRANT	TOTAL DEMAND APPARENT POWER	TOTAL CONNECTED APPARENT POWER	TOTAL DEMAND FACTOR	TOTAL ESTIMATED DEMAND CURRENT
LDP	62149 VA	60506 VA	64291 VA	519 A	176259 VA	186945 VA	94.28%	489 A
Grand total: 1	62149 VA	60506 VA	64291 VA					

* PANEL CONTAINS SUBSEQUENT PANEL LOADS:	
PRIMARY VOLTAGE:	208 V
SECONDARY VOLTAGE:	120 V
CALCULATED HIGH PHASE:	66415 VA
OVERALL TOTAL LOAD:	486 A
800A SERVICE IS ADEQUATE	

NEW PANEL: L3

LOCATION: JANITOR 119
SUPPLY FROM: LDP
MOUNTING: Surface
ENCLOSURE: Type 1

VOLTS: 120/208 Wye
PHASING: 3
WIRES: 4

A.I.C. RATING: 10 kA
CALULATED A.I.C.: 5,690 A
MAINS TYPE: MLO
MAINS RATING: 200 A
BUS RATING: 200 A

CKT	CIRCUIT DESCRIPTION	CODES	TRIP	POLES	A		B		C		POLES	TRIP	CODES	CIRCUIT DESCRIPTION	CKT
1	RECEPT RISER ROOM 102		20 A	1	360 VA	1800 VA					1	20 A		RECEPT 103, 109, 121	2
3	FACP		20 A	1			500 VA	180 VA			1	20 A		RECEPT DAYROOM	4
5	CUH-1 (#23)	13	20 A	1					136 VA	360 VA	1	20 A		RECEPT DAYROOM 121 TV W	6
7	RECEPT STOR. LOCKERS 122		20 A	1	720 VA	360 VA					1	20 A		RECEPT DAYROOM 121 TV N	8
9	RECEPT RM 104		20 A	1			180 VA	720 VA			1	20 A		RECEPT DAYROOM 121	10
11	RECEPT WORK RM 104 TV		20 A	1					360 VA	180 VA	1	20 A		RECEPT FRIDGE	12
13	RECEPT RM 104		20 A	1	180 VA	180 VA					1	20 A		RECEPT FRIDGE	14
15	RECEPT WORK ROOM 104		20 A	1			360 VA	180 VA			1	20 A		RECEPT FRIDGE	16
17	RECEPT WORK ROOM 104		20 A	1					360 VA	180 VA	1	20 A		RECEPT KITCHEN 108	18
19	RECEPT WORK RM 104 TV		20 A	1	360 VA	180 VA					1	20 A		RECEPT KITCHEN 108	20
21	RECEPT RM 104		20 A	1			180 VA	180 VA			1	20 A		RECEPT KITCHEN	22
23	RECEPT RM 104		20 A	1					180 VA	180 VA	1	20 A		RECEPT DISHWASHER	24
25	RECEPT RM 104 FLOOR BOX		20 A	1	180 VA	180 VA					1	20 A		RECEPT GARBAGE DISPOSAL	26
27	RECEPT RM 104 FLOOR BOX		20 A	1			180 VA	180 VA			1	20 A		RECEPT RANGE HOOD	28
29	RECEPT OFFICE 105		20 A	1					720 VA	180 VA	1	20 A		RECEPT KITCHEN RANGE	30
31	RECEPT OFFICE 105		20 A	1	360 VA	1260 VA					1	20 A	13	SAF-3 (#9)	32
33	RECEPT RM 105 TV		20 A	1			360 VA	180 VA			1	20 A		RECEPT KITCHEN 108	34
35	RECEPT RM 105 TV		20 A	1					360 VA	180 VA	1	20 A		RECEPT KITCHEN 108	36
37	RECEPT SLEEPING 106		20 A	1	540 VA	180 VA					1	20 A		RECEPT KITCHEN 108	38
39	RECEPT 107		20 A	1			180 VA	180 VA			1	20 A		RECEPT KITCHEN 108	40
41	LIGHTS COMMON AREA/SLEEP...	13	20 A	1					1046 VA	360 VA	1	20 A		RECEPT 119 & 120	42
43	LIGHTS SOUTH ROOMS	13	20 A	1	608 VA	180 VA					1	20 A		RECEPT KITCHEN ICE MAKER	44
45							7325 VA	1440 VA			1	20 A		RECEPT SLEEPING 115 & 117	46
47	ACCU-1 (#16)		80 A	3					7325 VA	360 VA	1	20 A		RECEPT BATH 116 & 118	48
49					7325 VA	360 VA					1	20 A		RECEPT LAUNDRY 114	50
51	RECEPT EXT NORTH		20 A	1			360 VA	2500 VA			2	30 A	8	RECEPT LAUNDRY 114 DRYER	52
53	RECEPT EXT		20 A	1					360 VA	2500 VA					54
55	RECEPT EXT		20 A	1	360 VA	180 VA					1	20 A		RECEPT LAUNDRY 114 WASHER	56
57	RECEPT EXT		20 A	1			180 VA	360 VA			1	20 A		RECEPT BATH 111 & 113	58
59	SMOKE DAMPER RM 119		20 A	1					0 VA	1440 VA	1	20 A		RECEPT SLEEPING 110 & 112	60
61	SPARE	13	20 A	1	0 VA	0 VA					1	20 A		SPARE	62
63	SPARE	13	20 A	1			0 VA	0 VA			1	20 A		SPARE	64
65	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	66
67	SPARE		20 A	1	0 VA	0 VA					1	20 A		SPARE	68
69	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	70
71	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	72
				CONNECTED LOAD:	15834 VA		15905 VA		16758 VA						
				EXISTING LOAD:	0 VA		0 VA		0 VA						
				TOTAL LOAD:	15834 VA		15905 VA		16758 VA		**HIGH PHASE**				
				FEED THRU AMPS:	0 A		0 A		0 A		16758 VA				
				TOTAL AMPS:	132 A		133 A		140 A						

CODES:

1	SEE DRAWINGS FOR CONDUIT & CONDUCTORS	6	EXISTING BREAKER ON, VERIFY SPARE	11	LSI TRIP UNIT
2	EXISTING BREAKER AND LOAD TO REMAIN	7	NEW BREAKER AND LOAD	12	PROVIDE LOCK ON DEVICE
3	EXISTING BREAKER AND NEW LOAD	8	GFCI BREAKER	13	AFCI BREAKER
4	EXISTING BREAKER TO BECOME SPARE	9	DEDICATED BREAKER		
5	EXISTING BREAKER OFF, VERIFY SPARE	10	HANDLE TIED BREAKER		

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Lighting	711 VA	125.00%	889 VA		
Lighting - Dwelling Unit	961 VA	100.00%	961 VA	**TOTAL CONN. LOAD:**	48497 VA
Motor	23372 VA	100.00%	23372 VA	**TOTAL EST. DEMAND:**	44854 VA
Power	5860 VA	100.00%	5860 VA	**TOTAL CONN.:**	135 A
Receptacle	17640 VA	78.34%	13820 VA	**TOTAL EST. DEMAND:**	125 A

NOTES:

NEW PANEL: LDP

LOCATION: ELEC. ROOM 135
SUPPLY FROM:
MOUNTING: Surface
ENCLOSURE: Type 1

VOLTS: 120/208 Wye
PHASING: 3
WIRES: 4

A.I.C. RATING: 22 kA
CALULATED A.I.C.: 15,270 A
MAINS TYPE: MLO
MAINS RATING: 800 A
BUS RATING: 800 A

CKT	CIRCUIT DESCRIPTION	CODES	TRIP	POLES	A		B		C		POLES	TRIP	CODES	CIRCUIT DESCRIPTION	CKT
1					18504 VA	2545 VA									2
3	L1		200 A	3			19018 VA	1634 VA			3	100 A		LLS (ATS-LS)	4
5									21094 VA	678 VA					6
7					15912 VA	0 VA					2	20 A		EG	8
9	L2		200 A	3			14595 VA	0 VA							10
11									16407 VA	0 VA					12
13					15834 VA	0 VA					3	200 A		SPARE	14
15	L3		200 A	3			15905 VA	0 VA							16
17									16758 VA	0 VA					18
19					9355 VA	0 VA					3	100 A		SPARE	20
21	H-1 (#11)		100 A	3			9355 VA	0 VA							22
23									9355 VA						24
25															26
27															28
29															30
31															32
33															34
35															36
37															38
39															40
41															42
				CONNECTED LOAD:	62149 VA		60506 VA		64291 VA						
				EXISTING LOAD:	0 VA		0 VA		0 VA						
				TOTAL LOAD:	62149 VA		60506 VA		64291 VA		**HIGH PHASE**				
				FEED THRU AMPS:	0 A		0 A		0 A		64291 VA				
				TOTAL AMPS:	520 A		504 A		538 A						

CODES:

1	SEE DRAWINGS FOR CONDUIT & CONDUCTORS	6	EXISTING BREAKER ON, VERIFY SPARE	11	LSI TRIP UNIT
2	EXISTING BREAKER AND LOAD TO REMAIN	7	NEW BREAKER AND LOAD	12	PROVIDE LOCK ON DEVICE
3	EXISTING BREAKER AND NEW LOAD	8	GFCI BREAKER	13	AFCI BREAKER
4	EXISTING BREAKER TO BECOME SPARE	9	DEDICATED BREAKER		
5	EXISTING BREAKER OFF, VERIFY SPARE	10	HANDLE TIED BREAKER		

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Lighting	7815 VA	125.00%	9769 VA		
Lighting - Dwelling Unit	1147 VA	100.00%	1147 VA	**TOTAL CONN. LOAD:**	186945 VA
Motor	129016 VA	100.00%	129016 VA	**TOTAL EST. DEMAND:**	176259 VA
Other	844 VA	100.00%	844 VA	**TOTAL CONN.:**	519 A
Power	12900 VA	100.00%	12900 VA	**TOTAL EST. DEMAND:**	489 A
Receptacle	35280 VA	64.17%	22640 VA		

NOTES:

NEW PANEL: LLS

LOCATION: DATA 202
SUPPLY FROM: LDP
MOUNTING: Surface
ENCLOSURE: Type 1

VOLTS: 120/208 Wye
PHASING: 3
WIRES: 4

A.I.C. RATING: 10 kA
CALULATED A.I.C.: 6,002 A
MAINS TYPE: MLO
MAINS RATING: 100 A
BUS RATING: 100 A

CKT	CIRCUIT DESCRIPTION	CODES	TRIP	POLES	A		B		C		POLES	TRIP	CODES	CIRCUIT DESCRIPTION	CKT
1	EM LITES SOUTH		20 A	1	1523 VA	0 VA					1	20 A		SPARE	2
3	EM LITES NORTH	13	20 A	1			318 VA	0 VA			1	20 A		SPARE	4
5	EM LITES 2ND FLOOR		20 A	1					157 VA	0 VA	1	20 A		SPARE	6
7	EXTERIOR LITES		20 A	1	600 VA	0 VA					1	20 A		SPARE	8
9	EXTERIOR LITES		20 A	1			1320 VA	0 VA			1	20 A		SPARE	10
11	EXTERIOR LITES		20 A	1					521 VA	0 VA	1	20 A		SPARE	12
13	EXTERIOR LITES		20 A	1	422 VA	0 VA					1	20 A		SPARE	14
15	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	16
17	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	18
19	SPARE		20 A	1	0 VA	0 VA					1	20 A		SPARE	20
21	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	22
23	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	24
25	SPARE		20 A	1	0 VA	0 VA					1	20 A		SPARE	26
27	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	28
29	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	30
31	SPARE		20 A	1	0 VA	0 VA					1	20 A		SPARE	32
33	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	34
35	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	36
37	SPARE		20 A	1	0 VA	0 VA					1	20 A		SPARE	38
39	SPARE		20 A	1			0 VA	0 VA			1	20 A		SPARE	40
41	SPARE		20 A	1					0 VA	0 VA	1	20 A		SPARE	42
				CONNECTED LOAD:	2545 VA		1634 VA		678 VA						
				EXISTING LOAD:	0 VA		0 VA		0 VA						
				TOTAL LOAD:	2545 VA		1634 VA		678 VA		**HIGH PHASE**				
				FEED THRU AMPS:	0 A		0 A		0 A		2545 VA				
				TOTAL AMPS:	22 A		15 A		6 A						

CODES:

1	SEE DRAWINGS FOR CONDUIT & CONDUCTORS	6	EXISTING BREAKER ON, VERIFY SPARE	11	LSI TRIP UNIT
2	EXISTING BREAKER AND LOAD TO REMAIN	7	NEW BREAKER AND LOAD	12	PROVIDE LOCK ON DEVICE
3	EXISTING BREAKER AND NEW LOAD	8	GFCI BREAKER	13	AFCI BREAKER
4	EXISTING BREAKER TO BECOME SPARE	9	DEDICATED BREAKER		
5	EXISTING BREAKER OFF, VERIFY SPARE	10	HANDLE TIED BREAKER		

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Lighting	3835 VA	125.00%	4793 VA		
Lighting - Dwelling Unit	186 VA	100.00%	186 VA	**TOTAL CONN. LOAD:**	4856 VA
Other	844 VA	100.00%	844 VA	**TOTAL EST. DEMAND:**	5814 VA
				TOTAL CONN.:	13 A
				TOTAL EST. DEMAND:	16 A

1 **NOTES: PROVIDE INTEGRAL SURGE PROTECTION DEVICE.**

PANEL INDEX E902	
L3	LDP
	LLS

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Interior Design | Industrial
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CONSULTANTS

CLIENT
BISMARCK FIRE DEPARTMENT

PROJECT DESCRIPTION
FIRE STATION 6

CITY BISMARK
STATE ND

ISSUE DATES

MARK	DESCRIPTION	DATE
1	ADDENDUM 3	11/17/2026
CD	100% CONSTRUCTION DOCUMENTS	10/29/2025

PROJECT NO: 20253510
DRAWN BY: TA
CHECKED BY: BW

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STAMP

REGISTERED PROFESSIONAL ENGINEER
BRIAN WENTLAND PE-27191
DATE 11/17/2026
NORTH DAKOTA

DRAWING TITLE
SCHEDULES

E902

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